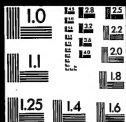


CENTIMETERS



14:1

# Thomas A Edison Papers

## A SELECTIVE MICROFILM EDITION PART V (1911-1919)

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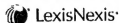
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**Thomas A. Edison Papers  
at  
Rutgers, The State University of New Jersey  
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**START**

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### **A Note on the Sources**

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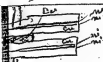


**NOTEBOOK SERIES  
NOTEBOOKS BY EDISON  
AND OTHER EXPERIMENTERS**

**Notebook Series -- Notebooks by Edison and Other Experimenters**  
**Disc Plating Experiments**  
**Notebook, N-20-06-12.2**

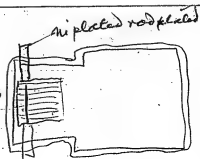
This notebook was used during June-September 1920 by Edison, Walter N. Archer, Frank Dettlef, Jr., Howard F. Redford, and possibly other experimenters. The entries pertain to the plating processes involved in the manufacture of disc records. The entries by Edison on the first page consist of a daily record of molds plated in "Bath 7" during June-August. The records, which are continued by Archer, report the date and time, specific gravity, volts, amps, crock temperature, and other conditions during plating. Occasional notes, suggestions, and instructions by Edison are interspersed throughout the early entries. The second part of the book relates to series of experiments conducted by Archer in August in which rubber varnish was used for protection against copper depositing on the backs of the molds. There is also a series of experiments in August and September on transferring molds from the nickel bath to the copper bath without drying after rinsing them free of the nickel solution. One page of instructions from Edison has been inserted into the book. The front cover is labeled "7" and is marked "Disc." The pages are unnumbered. Approximately 100 pages have been used.

Bath No 7.



One thickness  
5 a 2 lbs between  
to see Ni face  
to Ni face

No 7.



| me | SE   | Volt | Amp | Temp | Total Amp |
|----|------|------|-----|------|-----------|
| 40 | 1170 | 9.12 | 24  | 83   | 24        |
| 40 | 1170 | 9.12 | 25  | 82   | 25        |
| 40 | 1170 | 9.12 | 26  | 83   | 51        |
| 40 | 1170 | 9.3  | 27  | 82   | 78        |
| 40 | 1170 | 9.5  | 26  | 83   | 104       |
| 40 | 1175 | 9.5  | 27  | 83   | 131       |
| 40 | 1170 | 9.5  | 26  | 80   | 157       |
| 40 | 1170 | 9.5  | 27  | 80   | 184       |
| 40 | 1170 | 9.5  | 27  | 82   | 211       |
| 40 | 1170 | 9.5  | 27  | 82   | 238       |
| 40 | 1170 | 9.5  | 27  | 83   | 265       |
| 40 | 1170 | 9.5  | 27  | 83   | 292       |
| 40 | 1170 | 9.5  | 27  | 81   | 319       |
| 40 | 1170 | 9.5  | 27  | 85   | 345       |
| 40 | 1170 | 9.5  | 27  | 85   | 372       |
| 40 | 1170 | 9.5  | 27  | 84   | 399       |
| 40 | 1170 | 9.5  | 27  | 81   | 426       |
| 40 | 1170 | 9.5  | 27  | 82   | 454       |

96<sup>5</sup> 7

| Vol | SS   | Qolt | Comp             | Thm | Total Comp |
|-----|------|------|------------------|-----|------------|
| 3   |      |      |                  |     |            |
| 40  | 1170 | 9.5  | 27 $\frac{1}{2}$ | 82  | 480        |
| 40  | 1170 | 9.5  | 27 $\frac{1}{2}$ | 81  | 508        |
| 40  | 1170 | 9.5  | 27               | 81  | 534        |
| 40  | 1170 | 9.5  | 27               | 83  | 561        |
| 40  | 1170 | 9.5  | 27 $\frac{1}{2}$ | 82  | 588        |
| 40  | 1170 | 9.5  | 27               | 82  | 615        |
| 40  | 1170 | 9.5  | 27               | 82  | 642        |
| 40  | 1175 | 9.5  | 27               | 81  | 669        |
| 40  | 1175 | 9.5  | 27               | 81  | 696        |
| 40  | 1175 | 9.5  | 27               | 81  | 723        |
| 40  | 1175 | 9.5  | 27               | 82  | 750        |
| 40  | 1175 | 9.5  | 27               | 83  | 777        |
| 40  | 1175 | 9.5  | 27               | 83  | 804        |
| 40  | 1175 | 9.5  | 26               | 83  | 830        |
| 40  | 1175 | 9.5  | 26               | 83  | 856        |
| 40  | 1175 | 9.5  | 23               | 82  | 867 out    |

In June 12 - at 9:46 Am

86.9 Amp in 32 hours  
at 26 Amp in hour

1st Disc Out 7:10 PM  
June 13

June 13

Op-7 Beth. 2<sup>nd</sup> of ac in.

| M  | Lat  | Alt   | Comp   | Temp | Total Comp |
|----|------|-------|--------|------|------------|
| 20 | 1175 | 9 1/2 | 24     | 80   |            |
| 20 | 1170 | 9 1/2 | 25     | 86   | 25         |
| 20 | 1170 | 9 1/2 | 25     | 80   | 50         |
| 20 | 1170 | 9 1/2 | 25     | 81   | 75         |
| 20 | 1170 | 9 1/2 | 25     | 82   | 100        |
| 20 | 1170 | 9 1/2 | 25     | 80   | 125        |
| 20 | 1170 | 9 1/2 | 25     | 80   | 150        |
| 20 | 1170 | 9 1/2 | 25     | 82   | 175        |
| 20 | 1170 | 9 1/2 | 26     | 81   | 201        |
| 20 | 1170 | 9 1/2 | 24     | 80   | 225        |
| 20 | 1170 | 9 1/2 | 25     | 83   | 250        |
| 20 | 1170 | 9 1/2 | 25     | 83   | 275        |
| 20 | 1170 | 9 1/2 | 24     | 83   | 299        |
| 20 | 1170 | 9 1/2 | 23     | 83   | 322        |
| 20 | 1175 | 9 1/2 | 24     | 80   | 346        |
| 20 | 1175 | 9 1/2 | 23 1/2 | 80   | 369        |
| 20 | 1175 | 9 1/2 | 24     | 80   | 393        |
| 20 | 1175 | 9 1/2 | 24     | 80   | 417        |
| 20 | 1175 | 9 1/2 | 24     | 80   | 441        |
| 20 | 1175 | 9 1/2 | 25 1/2 | 80   | 465        |
| 20 | 1175 | 9 1/2 | 25     | 83   | 490        |
| 20 | 1175 | 9 1/2 | 25     | 83   | 515        |
| 20 | 1175 | 9 1/2 | 25     | 83   | 540        |
| 20 | 1175 | 9 1/2 | 24     | 82   | 564        |
| 20 | 1175 | 9 1/2 | 24     | 82   | 588        |
| 20 | 1175 | 9 1/2 | 24     | 80   | 612        |

over

July 7th Bath  
23uc

| W <sup>h</sup><br>AM | Libra | Volts | Comp   | Pump | Total Comp |
|----------------------|-------|-------|--------|------|------------|
| 00                   | 1175  | 9 1/2 | 25     | 80   | 637        |
| 00                   | 1175  | 9 1/2 | 24     | 80   | 661        |
| 00                   | 1175  | 9 1/2 | 25     | 80   | 686        |
| 00                   | 1175  | 9 1/2 | 24     | 80   | 710        |
| 00                   | 1175  | 9 1/2 | 23     | 80   | 733        |
| 00                   | 1175  | 9 1/2 | 23     | 80   | 756        |
| 00                   | 1175  | 9 1/2 | 24     | 80   | 780        |
| 00                   | 1175  | 9 1/2 | 23     | 80   | 803        |
| 00                   | 1175  | 9 1/2 | 23     | 83   | 826        |
| 00                   | 1175  | 9 1/2 | 23 1/2 | 83   | 849        |
| 00                   | 1175  | 9 1/2 | 23     | 82   | 872        |

Cord broke when cover was  
taken off

Out  
Cord broken

6  
washed  
in platted strap

July 7th Bath in June 13 - 11:00 P

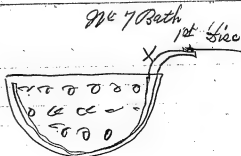
872 Comp in 36 hours  
at about 24 Comp Per hour

Out 11:00 O'clock  
June 15 A.M.

Eaten off - 20

The sections at sides a 6 eat  
off very much faster. The  
corrects the whole thing.  
Can't work this - perhaps if  
Sigs was replaced by  
steel ribbs might do better  
in plating want stand also  
over

Everything must be copper  
So far only. Anode is solid  
and the basket with pieces -



This Bath Contains Copper pieces  
that is only a little dissolved  
so more can be put in  
Weight of X Contact anode  
7 1/2 lbs Chips 16 lbs -

June 16 - PM

| PM   | Lbs  | Volts | Amps | Amps | Total |
|------|------|-------|------|------|-------|
| 2:30 | 1170 | 9 1/4 | 20   | 82   |       |
| 3:00 | 1170 | 9 1/4 | 22   | 83   | 22    |
| 3:30 | 1170 | 9 1/4 | 23   | 83   | 45    |
| 4:00 | 1170 | 9 1/4 | 23   | 83   | 68    |
| 4:30 | 1170 | 9 1/4 | 23   | 83   | 91    |
| 5:00 | 1170 | 9 1/4 | 24   | 80   | 115   |
| 5:30 | 1170 | 9 1/4 | 25   | 80   | 140   |
| 6:00 | 1170 | 9 1/4 | 25   | 80   | 165   |
| 6:30 | 1170 | 9 1/4 | 25   | 80   | 190   |
| 7:00 | 1170 | 9 1/4 | 25   | 80   | 215   |
| 7:30 | 1170 | 9 1/4 | 25   | 82   | 240   |

No 7 Bath

| Time    | V    | Volts | Amper | Temp | Total |
|---------|------|-------|-------|------|-------|
| 30      | 1170 | 9 1/2 | 25    | 83   | 285   |
| 30      | 1170 | 9 1/2 | 25    | 81   | 290   |
| 30      | 1170 | 9 1/2 | 25    | 81   | 315   |
| 30      | 1170 | 9 1/2 | 25    | 83   | 340   |
| 30      | 1170 | 9 1/2 | 25    | 83   | 365   |
| 36      | 1175 | 9 1/2 | 25    | 83   | 390   |
| 00      | 1175 | 9 1/2 | 25    | 81   | 415   |
| 30      | 1175 | 9-5   | 23    | 81   | 438   |
| 30      | 1175 | 9-5   | 23    | 82   | 461   |
| 30      | 1175 | 9-5   | 22    | 82   | 483   |
| 30      | 1175 | 9-5   | 22    | 82   | 505   |
| 30      | 1170 | 9-5   | 22    | 82   | 527   |
| 30      | 1170 | 9-5   | 22    | 82   | 549   |
| 30      | 1175 | 9-5   | 23    | 82   | 572   |
| 30      | 1175 | 9-5   | 22    | 82   | 594   |
| 30      | 1175 | 9-5   | 22    | 82   | 616   |
| 00      | 1175 | 9-5   | 23    | 82   | 639   |
| 30      | 1175 | 9-5   | 23    | 82   | 662   |
| 30      | 1175 | 9-5   | 23    | 80   | 685   |
| Time 18 |      |       |       |      |       |
| 00      | 1175 | 9-5   | 23    | 80   | 708   |
| 30      | 1175 | 9-5   | 23    | 80   | 731   |
| 00      | 1175 | 9-5   | 23    | 82   | 754   |
| 00      | 1175 | 9-5   | 22    | 80   | 776   |
| 00      | 1175 | 9-5   | 23    | 80   | 799   |

Current off  
" on



Bath No 7

| Time    | Volts | Amp | Temp | Total |
|---------|-------|-----|------|-------|
| 24 15   |       |     |      |       |
| 24 38   |       |     |      |       |
| 30 1175 | 9.5   | 23  | 80   | 822   |
| 30 1175 | 9.5   | 23  | 82   | 845   |
| 30 1175 | 9.5   | 23  | 83   | 868   |

Out  
37 hours

707 - 1st Disc Out June 18 - 5:30  
868 Amp 37 hours  
about 23 1/2 Amp per hour

End June 16 - 8:30 P.M.

May Bath 2<sup>nd</sup> Lie in  
same Anode

June - 18 -

| AM      | Volts      | Amp    | Total  |
|---------|------------|--------|--------|
| 1.00    | 1175 9 1/2 | 22     | 83     |
| 1.00    | 1175 9 1/2 | 21 1/2 | 83 21  |
| 2.00    | 1175 9-5   | 22     | 83 43  |
| 1.00    | 1175 9-5   | 22     | 83 65  |
| 2.00    | 1175 9-5   | 22     | 83 87  |
| 3.00    | 1175 9-5   | 22     | 83 109 |
| 4.00    | 1175 9-5   | 21     | 84 130 |
| 5.00    | 1175 9-5   | 21     | 84 151 |
| 6.00    | 1175 9-5   | 21     | 83 172 |
| 7.00    | 1175 9-5   | 21     | 83 193 |
| 8.00    | 1175 9-5   | 21     | 83 214 |
| 9.00    | 1175 9-5   | 21     | 83 235 |
| 10.00   | 1175 9-5   | 21     | 83 256 |
| 11.00   | 1175 9-5   | 21     | 83 277 |
| 12.00   | 1175 9-5   | 21     | 80 298 |
| June 19 |            |        |        |
| 1.00    | 1175 9-5   | 21     | 80 319 |
| 2.00    | 1175 9-5   | 21     | 80 340 |
| 3.00    | 1175 9-5   | 21     | 80 361 |
| 4.00    | 1175 9-5   | 21     | 80 382 |
| 5.00    | 1175 9-5   | 21     | 80 403 |
| 6.00    | 1175 9-5   | 21     | 80 424 |
| 7.00    | 1175 9-5   | 21     | 86 445 |
| 8.00    | 1175 9-5   | 21     | 86 466 |
| 9.00    | 1175 9-5   | 21     | 83 487 |

Me 7 Bath 2<sup>nd</sup> stage m

| TIME  | Ln   | Orth  | Comp   | Temp | Total             |
|-------|------|-------|--------|------|-------------------|
| 11:30 | 1175 | 9 1/2 | 21     | 83   | 508               |
| 11:30 | 1175 | 9 1/2 | 21     | 83   | 529               |
| 11:30 | 1175 | 9 1/2 | 20     | 83   | 549               |
| 11:30 | 1175 | 9-5   | 20     | 83   | 569               |
| 11:30 | 1175 | 9-5   | 21     | 83   | 590               |
| 11:30 | 1175 | 5-5   | 21     | 83   | 611               |
| 11:30 | 1175 | 9-5   | 21     | 83   | 632               |
| 11:30 | 1175 | 9 1/2 | 22     | 83   | 654               |
| 11:30 | 1175 | 9 1/2 | 21     | 83   | 685               |
| 11:30 | 1175 | 9 1/2 | 21     | 83   | 706               |
| 11:30 | 1175 | 9 1/2 | 20     | 83   | 726               |
| 11:30 | 1175 | 9 1/2 | 20 1/2 | 83   | 746               |
| 11:30 | 1175 | 9 1/2 | 21     | 83   | 767               |
| 11:30 | 1175 | 5 1/2 | 22     | 83   | 789               |
| 11:30 | 1175 | 9 1/2 | 22     | 83   | 811               |
| 11:30 | 1175 | 9 1/2 | 22     | 80   | 833               |
| 11:30 | 1175 | 9 1/2 | 21     | 80   | 854               |
| 11:30 | 1175 | 9 1/2 | 20     | 80   | 864               |
| Out   |      |       |        |      | 41 hours          |
|       |      |       |        |      | 21 Comp. Per hour |

ME 7 - 3 the disc in same mod

| TIME | Secs | Volts | Amps   | Temp | Total |
|------|------|-------|--------|------|-------|
| 30   | 1175 | 9.5   | 20     | 83   |       |
| 30   | 1175 | 9.5   | 21 1/2 | 83   | 21    |
| 30   | 1175 | 9.5   | 22     | 83   | 43    |
| 30   | 1175 | 9.5   | 22     | 83   | 65    |
| 30   | 1175 | 9.5   | 23     | 83   | 88    |
| 30   | 1175 | 9.5   | 23     | 83   | 111   |
| 30   | 1175 | 9.5   | 24     | 83   | 135   |
| 30   | 1175 | 9.5   | 24     | 83   | 159   |
| 30   | 1175 | 9.5   | 24     | 83   | 183   |
| 30   | 1175 | 9.5   | 24     | 83   | 207   |
| 30   | 1175 | 9.5   | 24     | 83   | 231   |
| 30   | 1175 | 9.5   | 25     | 83   | 256   |
| 30   | 1175 | 9.5   | 25     | 83   | 281   |
| 30   | 1175 | 9.5   | 25 1/2 | 83   | 306   |
| 30   | 1175 | 9.5   | 25     | 83   | 331   |
| 30   | 1175 | 9.5   | 25     | 83   | 356   |
| 30   | 1175 | 9.5   | 25     | 84   | 381   |
| 30   | 1175 | 9.5   | 24 1/2 | 82   | 405   |
| 30   | 1175 | 9.5   | 24     | 83   | 429   |
| 30   | 1175 | 9.5   | 24     | 83   | 453   |
| 30   | 1175 | 9.5   | 25     | 83   | 478   |
| 30   | 1175 | 9.5   | 25     | 83   | 503   |
| 30   | 1175 | 9.5   | 24     | 83   | 527   |
| 30   | 1175 | 9.5   | 24     | 83   | 551   |
| 30   | 1175 | 9.5   | 24     | 83   | 575   |

ME 7 Bath Amodeo Chamber filled  
up with Copper pieces.

Over

Power off at 5 o'clock  
started again at 5:15 PM

Nº 7 same Anecd.

| Time | Slm  | Volts | Imp | Humf | Total |
|------|------|-------|-----|------|-------|
| 30   | 1175 | 9 1/2 | 24  | 83   | 599   |
| 30   | 1175 | 9 1/2 | 24  | 83   | 623   |
| 30   | 1175 | 9 1/2 | 23  | 83   | 646   |
| 30   | 1175 | 9 1/2 | 23  | 83   | 669   |
| 30   | 1175 | 9 1/2 | 23  | 83   | 692   |
| 30   | 1175 | 9 1/2 | 23  | 83   | 715   |
| 30   | 1175 | 9 1/2 | 23  | 83   | 738   |
| 30   | 1175 | 9 1/2 | 23  | 83   | 761   |
| 30   | 1175 | 9 1/2 | 24  | 83   | 785   |
| 30   | 1175 | 9 1/2 | 24  | 83   | 809   |
| Time | 23   |       |     |      |       |
| 0    | 1175 | 9 1/2 | 24  | 80   | 833   |
| 0    | 1175 | 9 1/2 | 24  | 80   | 857   |

Cont

Beth 707 4th Disc in  
same anode

| NE  | Lat  | Long | Comp | Comp | Total |
|-----|------|------|------|------|-------|
| 100 | 1175 | 9-5  | 20   | 83   | 20    |
| 100 | 1175 | 9-5  | 20   | 83   | 40    |
| 100 | 1175 | 9-5  | 20   | 83   | 60    |
| 100 | 1175 | 9-5  | 20   | 83   | 80    |
| 100 | 1175 | 9-5  | 20   | 83   | 100   |
| 100 | 1175 | 9-5  | 21   | 83   | 121   |
| 100 | 1175 | 9-5  | 21   | 83   | 142   |
| 100 | 1175 | 9-5  | 21   | 83   | 163   |
| 100 | 1175 | 9-5  | 21   | 83   | 184   |
| 100 | 1175 | 9-5  | 21   | 83   | 205   |
| 100 | 1175 | 9-5  | 21   | 83   | 226   |
| 100 | 1170 | 9-5  | 21   | 83   | 247   |
| 100 | 1170 | 9-5  | 21   | 84   | 268   |
| 100 | 1170 | 9-5  | 21   | 84   | 289   |
| 100 | 1170 | 9-5  | 26   | 74   | 309   |
| 100 | 1170 | 9-5  | 20   | 84   | 329   |
| 100 | 1170 | 9-5  | 21   | 80   | 350   |
| 100 | 1170 | 9-5  | 22   | 80   | 372   |
| 100 | 1170 | 9-5  | 23   | 80   | 395   |
| 100 | 1170 | 9-5  | 24   | 80   | 419   |
| 100 | 1170 | 9-5  | 24   | 80   | 443   |
| 100 | 1170 | 9-5  | 24   | 80   | 467   |
| 100 | 1170 | 9-5  | 24   | 82   | 491   |

No 7: ampers increased from  
21 amp. to 24 amps during the night  
Reason circulation not running in  
in anode chamber.

OK 23

Beth #47 4th Disc in  
arrived

JUNE 24

| AM   | Lbr  | Bells | amp    | Comp | Total |
|------|------|-------|--------|------|-------|
| 100  | 1170 | 9 1/2 | 22     | 83   | 513   |
| 100  | 1170 | 9 1/2 | 22     | 83   | 535   |
| 100  | 1170 | 9 1/2 | 21     | 83   | 556   |
| 200  | 1170 | 9 1/2 | 20     | 83   | 576   |
| 100  | 1170 | 9 1/2 | 20     | 83   | 596   |
| 200  | 1170 | 9 1/2 | 20 1/2 | 83   | 616   |
| 100  | 1170 | 9 1/2 | 21     | 83   | 637   |
| 400  | 1170 | 9 1/2 | 20     | 83   | 657   |
| 500  | 1170 | 9 1/2 | 20     | 80   | 677   |
| 600  | 1170 | 9 1/2 | 20     | 80   | 697   |
| 700  | 1170 | 9 1/2 | 20     | 80   | 717   |
| 800  | 1170 | 9 1/2 | 20     | 80   | 737   |
| 900  | 1170 | 9 1/2 | 20     | 83   | 757   |
| 1000 | 1170 | 9 1/2 | 20     | 83   | 777   |
| 1100 | 1170 | 9 1/2 | 20     | 83   | 797   |
| 1200 | 1170 | 9 1/2 | 20     | 83   | 817   |

JUNE 25

| AM  | Lbr  | Bells | amp | Comp | Total |
|-----|------|-------|-----|------|-------|
| 100 | 1170 | 9 1/2 | 20  | 83   | 837   |
| 200 | 1170 | 9 1/2 | 19  | 81   | 856   |
| 300 | 1170 | 9 1/2 | 19  | 82   | 875   |

Beth #47 Out June 25 - 300 AM

875 Amp in 42 hours

about 20  $\frac{33}{42}$  Per hour

In June 23 900 K.M.

Out

2007 Beth 5th disc in  
same mod

JUNE 25

| PM    | Len  | Fath  | Comp   | Comp | Netel  |
|-------|------|-------|--------|------|--------|
| 7:00  | 1170 | 9 1/2 | 18     | 82   |        |
| 8:00  | 1170 | 9 1/2 | 18 1/2 | 82   | 18 1/2 |
| 9:00  | 1170 | 9 1/2 | 19     | 82   | 37     |
| 10:00 | 1170 | 9 1/2 | 19     | 82   | 56     |
| 11:00 | 1170 | 9 1/2 | 19     | 82   | 75     |
| 12:00 | 1170 | 9 1/2 | 19     | 80   | 94     |
| 1:00  | 1170 | 9 1/2 | 18     | 82   | 112    |
| 2:00  | 1170 | 9 1/2 | 17     | 83   | 129    |
| 3:00  | 1170 | 9 1/2 | 19     | 83   | 147    |
| 4:00  | 1170 | 9 1/2 | 19     | 83   | 167    |
| 5:00  | 1170 | 9 1/2 | 19     | 81   | 186    |
| 6:00  | 1170 | 9 1/2 | 19     | 81   | 205    |
| 7:00  | 1170 | 9 1/2 | 19     | 83   | 224    |
| 8:00  | 1170 | 9 1/2 | 18 1/2 | 83   | 242    |
| 9:00  | 1170 | 9 1/2 | 18 1/2 | 83   | 261    |
| 10:00 | 1170 | 9 1/2 | 18 1/2 | 83   | 279    |
| 11:00 | 1170 | 9 1/2 | 18 1/2 | 83   | 298    |
| 12:00 | 1170 | 9 1/2 | 18     | 80   | 315    |
| 1:00  | 1170 | 9-5   | 18 1/2 | 80   | 333    |
| 2:00  | 1170 | 9-5   | 18 1/2 | 80   | 351    |
| 3:00  | 1170 | 9-5   | 18 1/2 | 83   | 369    |
| 4:00  | 1170 | 9-5   | 18 1/2 | 83   | 388    |
| 5:00  | 1170 | 9-5   | 18 1/2 | 80   | 406    |

over



*No 7 Beth 5th Linc in*

| ONE     | Sh      | Volts | Amp    | Amp | Total   |
|---------|---------|-------|--------|-----|---------|
| 2:00 PM | 1170    | 9 1/2 | 18 1/2 | 80  | 424     |
| 3:00    | 1170    | 9.5   | 18 1/2 | 83  | 442     |
| 4:00    | 1170    | 9.5   | 18 1/2 | 83  | 459     |
| 5:00    | 1170    | 9.5   | 18 1/2 | 83  | 474     |
| 6:00    | 1170    | 9.5   | 18 1/2 | 83  | 496     |
| 7:00    | 1170    | 9.5   | 18     | 83  | 514     |
| 8:00    | 1170    | 9.5   | 18     | 80  | 532     |
| 9:00    | June 24 |       |        |     |         |
| 10:00   | 1170    | 9.5   | 18     | 81  | 550     |
| 11:00   | 1170    | 9.5   | 17     | 80  | 564     |
| 12:00   | 1170    | 9.5   | 17     | 81  | 584     |
| 1:00    | 1170    | 9.5   | 17     | 81  | 601     |
| 2:00    | 1170    | 9.5   | 18     | 81  | 619     |
| 3:00    | 1170    | 9.5   | 18     | 81  | 634     |
| 4:00    | 1170    | 9.5   | 19     | 81  | 656     |
| 5:00    | 1170    | 9.5   | 19     | 81  | 675     |
| 6:00    | 1170    | 9.5   | 20     | 83  | 695     |
| 7:00    | 1170    | 9.5   | 20     | 83  | 715     |
| 8:00    | 1170    | 9.5   | 18 1/2 | 83  | 733     |
| 9:00    | 1170    | 9.5   | 18 1/2 | 83  | 752     |
| 10:00   | 1170    | 9.5   | 19     | 83  | 771     |
| 11:00   | 1170    | 9.5   | 19     | 83  | 790     |
| 12:00   | 1170    | 9.5   | 19     | 83  | 809     |
| 1:00    | 1170    | 9.5   | 19     | 83  | 828     |
| 2:00    | 1170    | 9.5   | 19     | 83  | 847 Out |

*No 7 Beth 5th Linc Out*  
*866 Amp in 47 hours*  
*about 18 1/2 P. hours*  
*In June 25 - 7.00 P.M.*

| PM   | Sh   | Volts | Amp | Amp | Total |
|------|------|-------|-----|-----|-------|
| 7:00 | 1170 | 9.5   | 19  | 83  | 866   |

Aug 7 6th line in  
same mode

| W   | Sec     | Vol | Am   | Am | Total |
|-----|---------|-----|------|----|-------|
| 100 | 1175    | 9-5 | 18   | 83 |       |
| 100 | 1175    | 9-5 | 18   | 83 | 18    |
| 100 | 1175    | 9-5 | 18   | 81 | 36    |
| 100 | 1175    | 9-5 | 19   | 81 | 55    |
| 100 | 1175    | 9-5 | 19   | 81 | 74    |
| 100 | 1170    | 9-5 | 19   | 80 | 93    |
| 100 | June 25 |     |      |    |       |
| 100 | 1170    | 9-5 | 18   | 80 | 111   |
| 100 | 1170    | 9-5 | 18   | 80 | 129   |
| 100 | 1170    | 9-5 | 18   | 81 | 147   |
| 100 | 1170    | 9-5 | 18   | 81 | 165   |
| 100 | 1170    | 9-5 | 18   | 81 | 183   |
| 100 | 1170    | 9-5 | 18   | 81 | 201   |
| 100 | 1170    | 9-5 | 18   | 82 | 219   |
| 100 | 1170    | 9-5 | 17   | 82 | 236   |
| 100 | 1170    | 9-5 | 18   | 81 | 254   |
| 100 | 1170    | 9-5 | 18   | 81 | 272   |
| 100 | 1170    | 9-5 | 18   | 81 | 290   |
| 100 | 1170    | 9-5 | 17   | 80 | 307   |
| 100 | 1175    | 9-5 | 17   | 80 | 324   |
| 100 | 1175    | 9-5 | 17.5 | 83 | 341   |
| 100 | 1175    | 9-5 | 17.5 | 81 | 358   |
| 100 | 1158    | 9-5 | 17.5 | 82 | 375   |
| 100 | 1165    | 9-5 | 19   | 78 | 394   |
| 100 | 1165    | 9-5 | 19   | 80 | 413   |

#7 Bath

#6  $\frac{1}{2}$  dia

dia Scrap and

June 28, 29

| date | dia  | Volts | Amper. | Temp. | Attil |
|------|------|-------|--------|-------|-------|
| 28   | 1165 | 9-5   | 18-5   | 80    | 431   |
| 28   | 1165 | 9-5   | 18     | 80    | 449   |
| 28   | 1165 | 9-5   | 17.5   | 80    | 467   |
| 28   | 1165 | 9-5   | 17.5   | 80    | 483   |
| 29   | 1165 | 9-5   | 17 1/2 | 80    | 501   |
| 29   | 1165 | 9-5   | 17 1/2 | 80    | 518   |
| 29   | 1165 | 9-5   | 18     | 81    | 536   |
| 29   | 1165 | 9-5   | 18     | 81    | 554   |
| 29   | 1165 | 9-5   | 18     | 82    | 572   |
| 29   | 1165 | 9-5   | 18     | 82    | 590   |
| 29   | 1165 | 9-5   | 18     | 81    | 608   |
| 29   | 1165 | 9-5   | 18     | 81    | 626   |
| 29   | 1165 | 9-5   | 17 1/2 | 82    | 644   |
| 29   | 1165 | 9-5   | 17 1/2 | 82    | 661   |
| 29   | 1165 | 9-5   | 18     | 87    | 682   |
| 29   | 1165 | 9-5   | 18     | 86    | 700   |
| 29   | 1165 | 10    | 19     | 90    | 719   |
| 29   | 1165 | 10    | 19     | 90    | 738   |
| 29   | 1165 | 10    | 18     | 90    | 756   |
| 29   | 1165 | 10    | 18.5   | 90    | 774   |
| 29   | 1165 | 10    | 18     | 90    | 792   |
| 29   | 1165 | 10    | 17.5   | 88    | 809   |
| 29   | 1165 | 10    | 18     | 87    | 827   |
| 29   | 1165 | 10    | 18     | 85    | 845   |

✓  
 Raised  $\frac{1}{2}$  Volt  
 10.45 Temp.

$$48 \overline{) 863} \times 17.9$$

$$\begin{array}{r} 48 \times 17.9 \\ 832 \\ \hline 863 \\ \hline 31 \end{array}$$

Start June 27, 20 - 7 P.M.  
 Finish " 29, 20 - 7 P.M.  
 Total Amps 863  
 " howls 48  
 Average Amp. 17.9  
 #7 Both disc. seraph mode  
 #6 disc.

#7 Both

#6 disc

disc. seraph mode

| Date       | Temp | Volts | Amps | Total | Notes |
|------------|------|-------|------|-------|-------|
| June 27-28 | 85   | 10    | 18   | 863   | Out   |

= 7 Bats 7th Linc  
some small

| Size    | Volts | Imp    | Temp | Notes |
|---------|-------|--------|------|-------|
| 1165    | 10    | 17     | 85   |       |
| 1165    | 10    | 16     | 83   | 16    |
| June 20 |       |        |      |       |
| 1165    | 10    | 15 1/2 | 82   | 31    |
| 1165    | 10    | 15 1/2 | 82   | 47    |
| 1165    | 10    | 15 1/2 | 82   | 62    |
| 1165    | 10    | 15 1/2 | 81   | 78    |
| 1165    | 10    | 15 1/2 | 81   | 93    |
| 1165    | 10    | 15 1/2 | 81   | 109   |
| 1165    | 10    | 15 1/2 | 81   | 124   |
| 1165    | 10    | 15 1/2 | 81   | 140   |
| 1165    | 10    | 16     | 80   | 156   |
| 1165    | 10    | 17     | 82   | 173   |
| 1165    | 10    | 16     | 83   | 189   |
| 1165    | 10    | 16 1/2 | 80   | 205   |
| 1165    | 10    | 16     | 85   | 221   |
| 1165    | 10    | 16     | 82   | 237   |
| 1165    | 10    | 16     | 81   | 253   |
| 1165    | 10    | 16     | 80   | 269   |
| 1165    | 10    | 17     | 80   | 286   |
| 1165    | 10    | 16 1/2 | 80   | 303   |
| 1165    | 10    | 16 1/2 | 80   | 319   |
| 1165    | 10    | 16     | 81   | 335   |
| 1165    | 10    | 16     | 80   | 351   |
| 1165    | 10    | 16     | 80   | 367   |

\* 4<sup>th</sup> Bath 7<sup>th</sup> Line

| Sh                   | Orth | Imp              | Imp | Total |
|----------------------|------|------------------|-----|-------|
| 1165                 | 10   | 16               | 80  | 383   |
| 1165                 | 10   | 16               | 80  | 399   |
| July 1 <sup>20</sup> |      |                  |     |       |
| 1165                 | 10   | 15               | 80  | 414   |
| 1165                 | 10   | 15               | 80  | 429   |
| 1165                 | 10   | 15               | 82  | 444   |
| 1165                 | 16   | 16 $\frac{1}{2}$ | 83  | 460   |
| 1165                 | 10   | 16 $\frac{1}{2}$ | 83  | 477   |
| 1165                 | 10   | 16 $\frac{1}{2}$ | 83  | 493   |
| 1165                 | 10   | 16 $\frac{1}{2}$ | 85  | 510   |
| 1165                 | 10   | 16 $\frac{1}{2}$ | 85  | 526   |
| 1165                 | 10   | 165              | 85  | 542   |
| 1165                 | 10   | 16               | 85  | 559   |
| 1165                 | 10   | 16.5             | 83  | 575   |
| 1165                 | 10   | 16.5             | 83  | 592   |
| 1165                 | 10   | 16.5             | 85  | 608   |
| 1165                 | 10   | 16.5             | 85  | 625   |
| 1165                 | 10   | 16.5             | 85  | 641   |
| 1165                 | 10   | 16.5             | 85  | 658   |
| 1165                 | 10   | 16.5             | 84  | 675   |
| 1165                 | 10   | 16               | 84  | 690   |
| 1165                 | 10   | 16               | 82  | 706   |
| 1165                 | 10   | 16               | 82  | 722   |
| 1165                 | 10   | 16               | 82  | 738   |
| 1165                 | 10   | 16               | 82  | 754   |

Bath No. 7

7th Disc

| 7  | Sfr    | Volts | Amp | Temp | Total |
|----|--------|-------|-----|------|-------|
| 00 | 1165   | 10    | 16  | 82   | 770   |
| 00 | 1165   | 10    | 16  | 82   | 786   |
| 4  | July 9 |       |     |      |       |
| 00 | 1165   | 16    | 16  | 81   | 802   |
| 00 | 1165   | 10    | 16  | 81   | 818   |
| 00 | 1165   | 10    | 16  | 81   | 834   |
| 00 | 1165   | 16    | 16  | 81   | 850   |
| 00 | 1165   | 10    | 16  | 81   | 866   |

Out

Req. Strap feed under  
Maple wood drilled  
partition

Changed the Maple-  
wood drilled partition  
to a pure linen piece  
July -15, 20

The wood piece drilled

S-4 Sub

No 7 1st Disc in word Partition  
Beth

| Sh   | Volts | Imp    | Imp | Total |
|------|-------|--------|-----|-------|
| 1165 | 9-5   | 14     | 80  | 14    |
| 1165 | 9-5   | 14     | 80  | 14    |
| Sub  | 9-4   | 14     | 80  | 14    |
| 1165 | 9-5   | 14     | 80  | 28    |
| 1165 | 9-5   | 14     | 80  | 42    |
| 1165 | 9-5   | 15     | 83  | 57    |
| 1165 | 9-5   | 14 1/2 | 83  | 71    |
| 1165 | 9-5   | 14 1/2 | 83  | 86    |
| 1165 | 9-5   | 14 1/2 | 83  | 100   |
| 1165 | 9-5   | 14 1/2 | 83  | 115   |
| 1165 | 9-5   | 14 1/2 | 84  | 129   |
| 1165 | 9-5   | 15     | 84  | 144   |
| 1165 | 9-5   | 15     | 84  | 159   |
| 1165 | 9-5   | 15     | 82  | 174   |
| 1165 | 9-5   | 14 1/2 | 82  | 189   |
| 1165 | 9-5   | 15     | 82  | 204   |
| 1165 | 9-5   | 15     | 84  | 219   |
| 1165 | 9-5   | 15     | 83  | 234   |
| 1165 | 9-5   | 15     | 83  | 249   |
| 1165 | 9-5   | 14-5   | 83  | 263   |
| 1165 | 9-5   | 15     | 82  | 278   |
| 1165 | 9-5   | 15     | 82  | 293   |
| 1165 | 9-5   | 15     | 81  | 308   |
| 1165 | 9-5   | 14-5   | 81  | 322   |
| 1165 | 9-5   | 15     | 81  | 337   |

not a number



# MS 7 Bath 1st Linc

| Qty | Sh   | Qlty | Comp   | Unit | Total |              |
|-----|------|------|--------|------|-------|--------------|
| 100 | 1165 | 9-5  | 14-5   | 81   | 351   | not a not on |
| 100 | 1165 | 9-5  | 14-5   | 81   | 366   |              |
| 100 | 1165 | 9-5  | 14-5   | 81   | 380   |              |
| 100 | 1165 | 9-5  | 15     | 81   | 395   |              |
| 100 | 1165 | 9-5  | 14     | 81   | 409   |              |
| 100 | 1165 | 9-5  | 14     | 81   | 423   |              |
| 100 | 1165 | 9-5  | 14     | 81   | 437   |              |
| 100 | 1165 | 9-5  | 14     | 81   | 451   |              |
| 100 | 1165 | 9-5  | 14     | 81   | 465   |              |
| 100 | 1165 | 9-5  | 14     | 81   | 479   |              |
| 100 | 1165 | 9-5  | 14     | 81   | 493   | not a not on |
| 100 | 1165 | 9-5  | 14     | 81   | 507   |              |
| 100 | 1165 | 9-5  | 14     | 81   | 519   |              |
| 100 | 1165 | 9-5  | 14 1/2 | 81   | 533   |              |
| 100 | 1165 | 9-5  | 14 1/2 | 81   | 548   |              |
| 100 | 1165 | 9-5  | 14     | 81   | 562   |              |
| 100 | 1165 | 9-5  | 14 1/2 | 81   | 576   |              |
| 100 | 1165 | 9-5  | 15     | 81   | 591   |              |
| 100 | 1165 | 9-5  | 15     | 81   | 606   |              |
| 100 | 1165 | 9-5  | 14     | 81   | 620   |              |
| 100 | 1165 | 9-5  | 13 1/2 | 81   | 633   | Not a not on |
| 100 | 1165 | 9-5  | 13 1/2 | 81   | 647   |              |
| 100 | 1165 | 9-5  | 13 1/2 | 81   | 660   |              |
| 100 | 1165 | 9-5  | 13 1/2 | 81   | 674   |              |

Cleaned up. 043

Outside battery = .054  
Inside " = .058

53 /  $\frac{755}{53} \times 8$  / 14.2  
 $\frac{53}{21} \times 8$   
 $\frac{21}{130}$

Run total to 750 Amps.

#7 Bath 1st disc,  
after cleaning tank free from  
grease + oil.

Start July 3, 20. 11 AM

Finish " 5.20. 4 AM

Total Amp. 755

" hours 53

Average Amp. 14.2

No 7 Bath 1st Disc

| Day    | Stg  | Volts | Amps   | Time | Total |
|--------|------|-------|--------|------|-------|
| July 5 | 1165 | 9-5   | 13 1/2 | 81   | 687   |
| July 6 | 1165 | 9-5   | 13 1/2 | 81   | 701   |
| July 6 | 1165 | 9-5   | 13 1/2 | 81   | 714   |
| July 6 | 1165 | 9-5   | 13 1/2 | 81   | 728   |
| July 6 | 1165 | 9-5   | 13 1/2 | 81   | 741   |
| July 6 | 1165 | 9-5   | 13 1/2 | 81   | 755   |

Ant

53 hrs.

Mount in No 7 edge was  
rounded off

Disc, revolved  $1\frac{1}{2}$  R.P.M.

Added 5<sup>00</sup> general bath slope to  
plating solution 11<sup>30</sup> AM July 7.

Bath No 7.

9.5m  
2nd disc in

July 6

| 29m     | Spec   | Volts | amp  | Temp | Time |
|---------|--------|-------|------|------|------|
| 7:00    | 1165   | 9-5   | 13   | 83   |      |
| 7:00    | 1165   | 9-5   | 13   | 83   | 13   |
| 6:50    | 1165   | 9-5   | 13   | 84   | 26   |
| 7:00    | 1165   | 9-5   | 13   | 84   | 39   |
| 7:00    | 1165   | 9-5   | 13-5 | 84   | 52   |
| 7:20    | 1165   | 9-5   | 13-5 | 84   | 66   |
| 10:40   | 1165   | 9-5   | 13-5 | 84   | 79   |
| 11:00   | 1165   | 9-5   | 13-5 | 84   | 93   |
| 12:00   | 1165   | 9-5   | 14   | 84   | 107  |
| 1 AM    | July 7 |       |      |      |      |
| 1:00    | 1165   | 9-5   | 14   | 84   | 121  |
| 2:00    | 1165   | 9-5   | 14   | 84   | 135  |
| 3:00    | 1165   | 9-5   | 14   | 84   | 149  |
| 4:00    | 1165   | 9-5   | 14   | 84   | 163  |
| 5:00    | 1165   | 9-5   | 14   | 84   | 177  |
| 6:00    | 1165   | 9-5   | 14   | 84   | 191  |
| 7:00    | 1165   | 9-5   | 14   | 84   | 205  |
| 8:00    | 1165   | 9-5   | 14   | 84   | 219  |
| 9:00 AM | 1165   | 9-5   | 14.5 | 85   | 233  |
| 10:00   | 1165   | 9-5   | 14.5 | 85   | 248  |
| 11:00   | 1165   | 9-5   | 13.5 | 83   | 261  |
| 12:00   | 1165   | 9-5   | 13.5 | 83   | 275  |
| 1 PM    | 1165   | 9-5   | 13.5 | 82   | 288  |
| 2:00    | 1165   | 9-5   | 13.5 | 83   | 302  |
| 3:00    | 1165   | 9-5   | 13   | 83   | 315  |

$$\begin{array}{r}
 41 \overline{) 557} \quad 13.6 \\
 \underline{41} \phantom{0} \\
 147 \\
 \underline{123} \\
 240
 \end{array}$$

#7 Bath

2nd class inv.

| Sp. No.     | Vets | Onp  | Temp | Trick |
|-------------|------|------|------|-------|
| 1165        | 9.5  | 13.5 | 84   | 328   |
| 1165        | 9.5  | 13.5 | 85   | 342   |
| 1165        | 9.5  | 13.5 | 85   | 355   |
| 1165        | 9.5  | 13.5 | 84   | 369   |
| 1165        | 9.5  | 13.5 | 84   | 382   |
| 1165        | 6.5  | 13.5 | 83   | 396   |
| 1165        | 9.5  | 13   | 83   | 409   |
| 1165        | 9.5  | 13.5 | 82   | 422   |
| 1165        | 9.5  | 13.5 | 82   | 436   |
| July 8, 20. |      |      |      |       |
| 1165        | 9.5  | 13.5 | 82   | 449   |
| 1165        | 9.5  | 13.5 | 82   | 463   |
| 1165        | 9.5  | 13.5 | 82   | 476   |
| 1165        | 9.5  | 13.5 | 82   | 490   |
| 1165        | 9.5  | 13.5 | 82   | 503   |
| 1165        | 9.5  | 13.5 | 82   | 517   |
| 1165        | 9.5  | 13.5 | 82   | 530   |
| 1165        | 9.5  | 13.5 | 82   | 544   |
| 1165        | 9.5  | 13.5 | 80   | 557   |

Cont.

# 2 in plated disc. from # 2 in bath

Mach. wash, then dist. water rinse & put in mach. drier. Revolve for 12 minutes before copper plate. Run to 600 Amp hours. No skimmer in plate bath. After 12 min without current no specks was floating in bath. Knots taken off with pliers. was machine dried before knots were taken off. did not show oxidized.

# 7 Bath

dated July 8, 20.

Spd. Plate Amp

1165 9.5 13

1165 9.5 13

1165 9.5 13

1165 9.5 13

1165 9.5 13

1165 9.5 13

1165 9.5 13

1165 9.5 13

1165 9.5 13

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1165 9.5 13

1165 9.5 13

1165 9.5 13

1165 9.5 13

1165 9.5 13

1165 9.5 13

1165 9.5 13

1165 9.5 13

Temp. Total

80 13

80 26

80 39

80 52

80 65

80 78

80 91

80 104

80 117

80 130

80 143

80 156

80 168

80 181

80 194

80 207

80 220

80 233

80 246

80 258

80 271

80 283

80 296

80 309

80 322

80 335

3rd disc  
# 2 in plated disc  
from # 2 in bath

Added inside temp

Added 10.00 gen. bath slope to  
ropper job to sol. at 11 AM July 9

$$\begin{array}{r} 47 \\ 62.7 \\ \hline 114.7 \\ 160 \end{array} \div 13.3$$

Start July 8, 20 - 11 #4  
Finish " 16, 20 - 11 AM  
Total miles 6.27  
" hours 47  
Averageumps 13.3

# #7 Bath

3rd disc  
#2 isolated disc  
from 2 mi bath.

| Sp. Dr. | Vib. | Ampl. | Temp. | Total |
|---------|------|-------|-------|-------|
| 9.20    |      |       |       |       |
| 1170    | 9.5  | 13.5  | 80    | 309   |
| 1165    | 9.5  | 13.5  | 80    | 323   |
| 1165    | 9.5  | 13.5  | 82    | 336   |
| 1165    | 9.5  | 14    | 81    | 330   |
| 1165    | 9.5  | 14    | 81    | 364   |
| 1165    | 9.5  | 14    | 80    | 378   |
| 1165    | 9.5  | 14    | 80    | 392   |
| 1165    | 9.5  | 14    | 80    | 406   |
| 1165    | 9.5  | 14    | 80    | 420   |
| 1165    | 9.5  | 14    | 80    | 434   |
| 1165    | 9.5  | 14    | 80    | 448   |
| 1165    | 9.5  | 14    | 80    | 462   |
| 1165    | 9.5  | 14    | 80    | 476   |
| 10.20   |      |       |       |       |
| 1165    | 9.5  | 14    | 80    | 490   |
| 1165    | 9.5  | 14    | 80    | 504   |
| 1165    | 9.5  | 14    | 80    | 518   |
| 1165    | 9.5  | 14    | 80    | 532   |
| 1165    | 9.5  | 13.5  | 80    | 545   |
| 1165    | 9.5  | 13.5  | 80    | 559   |
| 1165    | 9.5  | 13.5  | 80    | 572   |
| 1165    | 9.5  | 13.5  | 80    | 586   |
| 1165    | 9.5  | 13.5  | 80    | 600   |
| 1165    | 9.5  | 13.5  | 80    | 613   |
| 1165    | 9.5  | 13.5  | 80    | 627   |

Ant 47 hrs

No 2 Nickel mould washed  
well and rinsed with distilled  
water put in wet  
put in No 7 Bath for 10 minutes  
with current off

The Ni in No 7 Bath had edge  
piled off 1" long perfectly  
edge too sharp

Put current on with screw head up  
Want to see how it beads when  
taken out.

9:00 AM Put in on soap  
Bues

No 7 Bath

|     | Volts    | Amp  | Temp | Temp |
|-----|----------|------|------|------|
| 0   | 1165 9-5 | 12   | 80   |      |
| 10  | 1165 9-5 | 13   | 80   | 13   |
| 20  | 1165 9-5 | 13   | 80   | 26   |
| 30  | 1165 9-5 | 12-5 | 80   | 38   |
| 40  | 1165 9-5 | 13   | 80   | 51   |
| 50  | 1165 9-5 | 13   | 80   | 64   |
| 60  | 1165 9-5 | 12   | 80   | 76   |
| 70  | 1165 9-5 | 12   | 80   | 88   |
| 80  | 1165 9-5 | 12   | 80   | 100  |
| 90  | 1165 9-5 | 12   | 80   | 112  |
| 100 | 1165 9-5 | 12   | 80   | 124  |
| 110 | 1165 9-5 | 13   | 80   | 136  |
| 120 | 1165 9-5 | 12   | 80   | 148  |
| 130 | 1165 9-5 | 14   | 80   | 162  |
| 140 | 1165 9-5 | 14   | 80   | 176  |
| 150 | 1165 9-5 | 13   | 80   | 188  |
| 160 | 1165 9-5 | 13   | 80   | 202  |
| 170 | 1165 9-5 | 13   | 80   | 215  |
| 180 | 1165 5-5 | 13   | 81   | 228  |
| 190 | 1165 4-5 | 13-5 | 80   | 241  |
| 200 | 1165 4-5 | 13-5 | 80   | 255  |
| 210 | 1165 9-5 | 13-5 | 80   | 268  |
| 220 | 1165 9-5 | 18-5 | 81   | 281  |
| 230 | 1165 9-5 | 13-5 | 81   | 295  |

July 7. Bath n face

JULY

PM

8:00

9:00

10:00

11:00

12:00

1:00

2:00

3:00

4:00

5:00

6:00

7:00

8:00

9:00

10:00

11:00

12:00

1:00

2:00

3:00

4:00

5:00

6:00

7:00

8:00

9:00

10:00

11:00

12:00

1:00

2:00

3:00

4:00

5:00

6:00

7:00

8:00

9:00

10:00

11:00

12:00

| Time    | Ortho | Amph | Amph | Total |
|---------|-------|------|------|-------|
| 11:05   | 9.5   | 13.5 | 81   | 308   |
| 11:05   | 9.5   | 13.5 | 81   | 322   |
| 11:05   | 9.5   | 13.5 | 81   | 335   |
| 11:05   | 9.5   | 13.5 | 81   | 349   |
| 11:05   | 9.5   | 13.5 | 81   | 362   |
| July 12 |       |      |      |       |
| 11:05   | 9.5   | 13   | 81   | 375   |
| 11:05   | 9.5   | 13   | 81   | 388   |
| 11:05   | 9.5   | 13   | 81   | 401   |
| 11:05   | 9.5   | 13   | 81   | 414   |
| 11:05   | 9.5   | 13   | 81   | 427   |
| 11:05   | 9.5   | 13   | 81   | 440   |
| 11:05   | 9.5   | 13   | 81   | 453   |
| 11:05   | 9.5   | 13   | 81   | 467   |
| 11:05   | 9.5   | 13.5 | 83   | 480   |
| 11:05   | 9.5   | 13.5 | 82   | 494   |
| 11:05   | 9.5   | 13.5 | 82   | 507   |
| 11:05   | 9.5   | 13.5 | 80   | 521   |
| 11:05   | 9.5   | 13.5 | 80   | 534   |
| 11:05   | 9.5   | 13.5 | 80   | 548   |
| 11:05   | 9.5   | 13   | 80   | 561   |
| 11:05   | 9.5   | 13   | 80   | 574   |
| 11:05   | 9.5   | 14   | 80   | 588   |
| 11:05   | 9.5   | 14   | 80   | 602   |
| 11:05   | 9.5   | 14   | 80   | 616   |

Start take out  
yet want to  
be show it  
heads when  
taken out



61802.0 | 13.1  
 61  
 192  
 183  
 90

Start July 10, at 8:20 PM.  
 Finish " 13 " 9 AM.  
 Total Amps 802  
 Average " 13.1

#7 Bath

| Volts       | Amps | Watts | Total |
|-------------|------|-------|-------|
| 116.5       | 9.5  | 14    | 80    |
| 116.5       | 9.5  | 13.5  | 81    |
| 116.5       | 9.5  | 13.5  | 83    |
| 116.5       | 9.5  | 13.5  | 83    |
| 116.5       | 9.5  | 13.5  | 83    |
| July 13, 20 |      |       |       |
| 116.5       | 9.5  | 13.5  | 81    |
| 116.5       | 9.5  | 13.5  | 81    |
| 116.5       | 9.5  | 13    | 81    |
| 116.5       | 9.5  | 13    | 81    |
| 116.5       | 9.5  | 13    | 81    |
| 116.5       | 9.5  | 13    | 82    |
| 116.5       | 9.5  | 13    | 82    |
| 116.5       | 9.5  | 13    | 82    |

Alt

Rev. 2 minutes in Ni bath, then  
full current, put in dry.

At 191 Amp hours  
Nick washed - rinsed distilled water  
dried on whirler.

Put in with full current on  
dry. Coffee disc.

Mr Edison wants to examine  
the wood filter when this  
disc is taken out.

| #7 Bath |         |       |      |       |                        |
|---------|---------|-------|------|-------|------------------------|
| Time    | Sp. Gr. | Volts | Amps | Temp  | Total                  |
| Started |         |       |      | 13 20 | at 10 <sup>30</sup> AM |
| 01:00   | 1165    | 9.5   | 14   | 82    |                        |
| 1:30    | 1165    | 9.5   | 13.5 | 83    | 13.5                   |
| 2:00    | 1165    | 9.5   | 14.5 | 83    | 28                     |
| 2:30    | 1165    | 9.5   | 14   | 83    | 42                     |
| 3:00    | 1165    | 9.5   | 14   | 85    | 56                     |
| 3:30    | 1165    | 9.5   | 13.5 | 84    | 69                     |
| 4:00    | 1165    | 9.5   | 13.5 | 85    | 83                     |
| 4:30    | 1165    | 9.5   | 13.5 | 80    | 96                     |
| 5:00    | 1165    | 9.5   | 13.5 | 80    | 110                    |
| 5:30    | 1165    | 9.5   | 13.5 | 80    | 123                    |
| 6:00    | 1165    | 9.5   | 13.5 | 85    | 137                    |
| 6:30    | 1165    | 9.5   | 15   | 84    | 152                    |
| 7:00    | 1165    | 9.5   | 14.5 | 83    | 166                    |
| 7:30    | 1165    | 9.5   | 14.5 | 83    | 181                    |
| 8:00    | 1165    | 9.5   | 14.5 | 83    | 195                    |
| 8:30    | 1165    | 9.5   | 14   | 83    | 208                    |
| 9:00    | 1165    | 9.5   | 13   | 83    | 221                    |
| 9:30    | 1165    | 9.5   | 13   | 83    | 234                    |
| 10:00   | 1165    | 9.5   | 13   | 83    | 247                    |
| 10:30   | 1165    | 9.5   | 13   | 83    | 260                    |
| 11:00   | 1165    | 9.5   | 13   | 84    | 273                    |
| 11:30   | 1165    | 9.5   | 13   | 84    | 286                    |
| 12:00   | 1165    | 9.5   | 12.5 | 83    | 299                    |
| 12:30   | 1175    | 9.5   | 14   | 80    | 313                    |

$$\begin{array}{r} 46 \overline{) 618} \\ \underline{158} \\ 200 \\ \underline{184} \end{array} \quad 13.4$$

Total Amps = 618  
 11 hour = 46  
 Average Amps = 13.4

7 Bath

| Time  | Voltage | Amps | Temp | Total  |
|-------|---------|------|------|--------|
| 10:20 | 116.5   | 9.5  | 14.5 | 80 328 |
| 11:30 | 116.5   | 9.5  | 14.5 | 80 343 |
| 12:30 | 116.5   | 9.5  | 13   | 80 356 |
| 1:30  | 116.5   | 9.5  | 13   | 80 369 |
| 2:30  | 116.5   | 9.5  | 13   | 83 382 |
| 3:30  | 116.5   | 9.5  | 13   | 87 395 |
| 4:30  | 116.5   | 9.5  | 13   | 85 408 |
| 5:30  | 116.5   | 9.5  | 13   | 85 421 |
| 6:30  | 116.5   | 9.5  | 13   | 85 434 |
| 7:30  | 116.5   | 9.5  | 13.5 | 85 447 |
| 8:30  | 116.5   | 9.5  | 13.5 | 85 461 |
| 9:30  | 116.5   | 9.5  | 13.5 | 83 474 |
| 10:30 | 116.5   | 9.5  | 13.5 | 83 488 |
| 11:30 | 116.5   | 9.5  | 13.5 | 83 501 |
| 12:30 | 116.5   | 9.5  | 13   | 83 514 |
| 1:30  | 116.5   | 9.5  | 13   | 83 527 |
| 2:30  | 116.5   | 9.5  | 13   | 83 540 |
| 3:30  | 116.5   | 9.5  | 13   | 81 553 |
| 4:30  | 116.5   | 9.5  | 13   | 81 566 |
| 5:30  | 116.5   | 9.5  | 13   | 81 579 |
| 6:30  | 116.5   | 9.5  | 13   | 81 592 |
| 7:30  | 116.5   | 9.5  | 13   | 81 605 |
| 8:30  | 116.5   | 9.5  | 13   | 81 618 |

Ant

#1 Nickel taken out 10 P.M.

July 15 at 70 Amp

① Treatment in Nickel bath

Put in dry, turned one minute with no current

Then full current put on.

② Treatment in Copper

Put in dry with full current on.

Cleaned out Copper bath and changed maple wood screen, drilled partitions to a linen one

Start July 15, 20 #7 Copper

|    | Sp. Gr. | Volts | Amps | Temp | Total |
|----|---------|-------|------|------|-------|
| 1  | 1165    | 9.5   | 18.5 | 92   |       |
| 2  | 1165    | 9.5   | 19   | 92   |       |
| 3  | 1165    | 9.5   | 19   | 93   |       |
| 4  | 1165    | 9.5   | 19   | 93   |       |
| 5  | 1165    | 9.5   | 19   | 93   |       |
| 6  | 1165    | 9.5   | 19   | 93   |       |
| 7  | 1165    | 9.5   | 19   | 93   |       |
| 8  | 1165    | 9.5   | 19   | 93   |       |
| 9  | 1165    | 9.5   | 19   | 93   |       |
| 10 | 1165    | 9.5   | 19   | 93   |       |
| 11 | 1165    | 9.5   | 19   | 93   |       |
| 12 | 1165    | 9.5   | 19   | 93   |       |
| 13 | 1165    | 9.5   | 19   | 93   |       |
| 14 | 1165    | 9.5   | 19   | 93   |       |
| 15 | 1165    | 9.5   | 19   | 93   |       |
| 16 | 1165    | 9.5   | 19   | 93   |       |
| 17 | 1165    | 9.5   | 19   | 93   |       |
| 18 | 1165    | 9.5   | 19   | 93   |       |
| 19 | 1165    | 9.5   | 19   | 93   |       |
| 20 | 1165    | 9.5   | 19   | 93   |       |
| 21 | 1165    | 9.5   | 19   | 93   |       |
| 22 | 1165    | 9.5   | 19   | 93   |       |
| 23 | 1165    | 9.5   | 19   | 93   |       |
| 24 | 1165    | 9.5   | 19   | 93   |       |
| 25 | 1165    | 9.5   | 19   | 93   |       |
| 26 | 1165    | 9.5   | 19   | 93   |       |
| 27 | 1165    | 9.5   | 19   | 93   |       |
| 28 | 1165    | 9.5   | 19   | 93   |       |
| 29 | 1165    | 9.5   | 19   | 93   |       |
| 30 | 1165    | 9.5   | 19   | 93   |       |
| 31 | 1165    | 9.5   | 19   | 93   |       |
| 32 | 1165    | 9.5   | 19   | 93   |       |
| 33 | 1165    | 9.5   | 19   | 93   |       |
| 34 | 1165    | 9.5   | 19   | 93   |       |
| 35 | 1165    | 9.5   | 19   | 93   |       |
| 36 | 1165    | 9.5   | 19   | 93   |       |
| 37 | 1165    | 9.5   | 19   | 93   |       |
| 38 | 1165    | 9.5   | 19   | 93   |       |
| 39 | 1165    | 9.5   | 19   | 93   |       |
| 40 | 1165    | 9.5   | 19   | 93   |       |
| 41 | 1165    | 9.5   | 19   | 93   |       |
| 42 | 1165    | 9.5   | 19   | 93   |       |
| 43 | 1165    | 9.5   | 19   | 93   |       |
| 44 | 1165    | 9.5   | 19   | 93   |       |
| 45 | 1165    | 9.5   | 19   | 93   |       |
| 46 | 1165    | 9.5   | 19   | 93   |       |
| 47 | 1165    | 9.5   | 19   | 93   |       |
| 48 | 1165    | 9.5   | 19   | 93   |       |
| 49 | 1165    | 9.5   | 19   | 93   |       |
| 50 | 1165    | 9.5   | 19   | 93   |       |

Transferred from  
#1 Ni Bath  
July 15, 20  
Total Amps =  
70 Ni Plated

$$\begin{array}{r} 36 \overline{) 641} \quad | 17.8 \\ \underline{252} \\ 291 \\ \underline{288} \end{array}$$

Total Amps 641  
 " hours 36  
 Average Amps 17.8

| #7 Bath |       |       |      |      |       |
|---------|-------|-------|------|------|-------|
| Time    | Temp  | Volts | Amps | Secs | Total |
| 10:20   | 116.5 | 9.5   | 18   | 88   | 427   |
| 11:15   | 116.5 | 9.5   | 18   | 89   | 445   |
| 12:15   | 116.5 | 9.5   | 17.5 | 89   | 463   |
| 1:15    | 116.5 | 9.5   | 17.5 | 201  | 481   |
| 2:15    | 116.5 | 9.5   | 18   | 90   | 499   |
| 3:15    | 116.5 | 9.5   | 18   | 70   | 517   |
| 4:15    | 116.5 | 9.5   | 18   | 70   | 535   |
| 5:15    | 116.5 | 9.5   | 18   | 70   | 553   |
| 6:15    | 116.5 | 9.5   | 18   | 70   | 571   |
| 7:15    | 116.5 | 9.5   | 17.5 | 93   | 588   |
| 8:15    | 116.5 | 9.5   | 17.5 | 93   | 606   |
| 9:15    | 116.5 | 9.5   | 18   | 93   | 624   |
| 10:15   | 116.5 | 9.5   | 17.5 | 93   | 641   |

Cent

Put in. 1st. Bath day  
full current for.

# #7 Bath

Started July 17, 20 @ 11:30 AM.

| Time     | Sp. Dr. | Volta | Amper. | Temp. | Total |
|----------|---------|-------|--------|-------|-------|
| 11:30 AM | 1165    | 9.5   | 17     | 90    |       |
| 12:30 PM | 1165    | 9.5   | 17     | 90    | 17    |
| 1:30 PM  | 1170    | 9.5   | 17     | 90    | 34    |
| 2:30 PM  | 1170    | 9.5   | 17     | 90    | 51    |
| 3:30 PM  | 1170    | 9.5   | 17     | 95    | 68    |
| 4:30 PM  | 1170    | 9.5   | 17     | 95    | 85    |
| 5:30 PM  | 1170    | 9.5   | 17.5   | 93    | 102   |
| 6:30 PM  | 1170    | 9.5   | 17     | 90    | 119   |
| 7:30 PM  | 1170    | 9.5   | 17     | 90    | 136   |
| 8:30 PM  | 1170    | 9.5   | 17     | 90    | 153   |
| 9:30 PM  | 1170    | 9.5   | 17     | 90    | 170   |
| 10:30 PM | 1170    | 9.5   | 18     | 89    | 188   |
| 11:30 PM | 1170    | 9.5   | 18     | 92    | 206   |
| 12:30 AM | 1170    | 9.5   | 18     | 92    | 224   |
| AM       | July 18 |       |        |       |       |
| 1.00     | 1170    | 9.5   | 19     | 92    | 243   |
| 2.00     | 1170    | 9.5   | 20     | 92    | 263   |
| 3.00     | 1170    | 9.5   | 20     | 92    | 283   |
| 4.00     | 1170    | 9.5   | 19     | 92    | 302   |
| 5.00     | 1170    | 9.5   | 19     | 92    | 321   |
| 6.00     | 1170    | 9.5   | 19     | 90    | 340   |
| 7.00     | 1170    | 9.5   | 19     | 90    | 359   |
| 8.00     | 1170    | 9.5   | 19     | 90    | 378   |
| 9.00     | 1170    | 9.5   | 19     | 90    | 397   |
| 10.00    | 1170    | 9.5   | 19     | 90    | 416   |

Transfer from  
#2 Vi Bath.  
July 17, 20.  
133 Amp. in.  
spental

$41) 753 \text{ } \overline{) 18.3}$   
 $\frac{41}{343}$   
 $\frac{343}{110}$   
 $\frac{110}{0}$   
 Total amps = 753  
 " hours = 41  
 Average amp = 18.3

#7 Bath  
July 18-28

| AM   | PM   | Volts | Amps | Watts |
|------|------|-------|------|-------|
| 1100 | 1170 | 9-5   | 19   | 98    |
| 1240 | 1170 | 9-5   | 19   | 90    |
| 1340 | 1170 | 9-5   | 19   | 92    |
| 1400 | 1170 | 9-5   | 19   | 92    |
| 2    | 1170 | 9-5   | 19   | 92    |
| 3    | 1170 | 9-5   | 19   | 92    |
| 4    | 1170 | 9-5   | 19-5 | 94    |
| 5    | 1170 | 9-5   | 19-5 | 94    |
| 6    | 1170 | 9-5   | 19-5 | 94    |
| 7    | 1170 | 9-5   | 19-5 | 94    |
| 8    | 1170 | 9-5   | 19-5 | 94    |
| 9    | 1170 | 9-5   | 19   | 90    |
| 10   | 1170 | 9-5   | 18-5 | 90    |
| 11   | 1170 | 9-5   | 18-5 | 90    |
| 12   | 1170 | 9-5   | 18   | 90    |
| AM   |      | July  | 19   |       |
| 1000 | 1170 | 9-5   | 17-5 | 10    |
| 2000 | 1170 | 9-5   | 17-5 | 117   |
| 3000 | 1170 | 9-5   | 18   | 135   |
| 4000 | 1170 | 9-5   | 18   | 153   |

1000 of 1170 Watts  
 1000 of 1170 Watts  
 1000 of 1170 Watts  
 1000 of 1170 Watts

604

#7 Butte

Rubber  
Hornish  
#16

| TIME  | Sp. Gr. | Imp. | Roll | Temp. | Total |
|-------|---------|------|------|-------|-------|
| 11 AM | 1170    | 80   | 7.5  | 14    |       |
| 12    | "       | "    | "    | 16    | 16    |
| 1 PM  | 1170    | 80   | 9.5  | 16    | 32    |
| 2     | "       | "    | "    | 15    | 47    |
| 3     | "       | "    | "    | 15    | 62    |
| 4     | "       | "    | "    | 15    | 77    |
| 5     | "       | "    | "    | 15    | 92    |
| 6     | "       | "    | "    | 14    | 106   |
| 7     | "       | "    | "    | 14    | 120   |
| 8     | "       | "    | "    | 14    | 134   |
| 9     | "       | "    | "    | 14    | 148   |
| 10    | "       | "    | "    | 15    | 163   |
| 11 AM | "       | "    | "    | 15    | 178   |
| 12    | "       | "    | "    | 15    | 193   |
| 1 PM  | "       | "    | "    | 15    | 208   |
| 2     | "       | "    | "    | 15    | 223   |
| 3     | "       | "    | "    | 15    | 238   |
| 4     | "       | "    | "    | 15    | 253   |
| 5     | "       | "    | "    | 15    | 268   |
| 6     | "       | "    | "    | 15    | 283   |
| 7     | "       | "    | "    | 15    | 298   |
| 8     | "       | "    | "    | 16    | 314   |
| 9     | "       | "    | "    | 16    | 330   |
| 10    | "       | "    | "    | 16    |       |
| 11    | "       | "    | "    | 16    |       |
| 12    | "       | "    | "    | 16    |       |
| 1 PM  | 1170    | 80   | 9.5  | 16    |       |

Avg. 80



#7 Bath

Rabbitdom

#10

| Time | Temp | Sp. Gr. | Sp. T. | Vel. | Temp | Sp. Gr. |
|------|------|---------|--------|------|------|---------|
| 2 AM | 1170 | 80      | 9.5    | 14   | 346  |         |
| 3    | "    | "       | "      | 16   | 360  |         |
| 4    | "    | "       | "      | 16   | 376  |         |
| 5    | "    | "       | "      | 16   | 392  |         |
| 6    | "    | "       | "      | 16   | 408  |         |
| 7    | "    | "       | "      | 16   | 424  |         |
| 8    | "    | "       | "      | 16   | 440  |         |
| 9    | "    | "       | "      | 16   | 456  |         |
| 10   | "    | "       | "      | 16   | 472  |         |
| 11   | "    | "       | "      | 15.5 | 487  |         |
| 12   | "    | "       | "      | 15   | 492  |         |
| 1 PM | "    | "       | "      | 15   | 517  |         |
| 2    | "    | "       | "      | 15.5 | 533  |         |
| 3    | "    | "       | "      | 16   | 549  |         |
| 4    | "    | "       | "      | 16   | 565  |         |
| 5    | "    | "       | "      | 15.5 | 580  |         |
| 6    | 1175 | "       | "      | 15.5 | 596  |         |
| 7    | "    | "       | "      | 15.5 | 711  |         |
| 8    | "    | "       | "      | 15.5 | 727  |         |
| 9    | "    | "       | "      | "    | "    |         |
| 10   | "    | "       | "      | "    | "    |         |
| 11   | "    | "       | "      | "    | "    |         |
| 12   | "    | "       | "      | "    | "    |         |
| 1 PM | "    | "       | "      | "    | "    |         |

#1727/17

Cent



Calgon.

#2 Bath

Rubbermaid #16

Start Aug. 3, at 10 AM.

| TIME  | Sp. Su | Temp. | Volts | Amper | Total |
|-------|--------|-------|-------|-------|-------|
| 10 AM | 1170   | 80    | 9.5   | 14.5  | 14    |
| 11    | "      | "     | "     | 14.5  | 29    |
| 12    | "      | "     | "     | 14.5  | 43    |
| 1 PM  | "      | "     | "     | 14.5  | 57    |
| 2     | "      | "     | "     | 14.5  | 72    |
| 3     | "      | "     | "     | 14.5  | 86    |
| 4     | "      | "     | "     | 14.5  | 102   |
| 5     | "      | 84    | 8.5   | 15.5  | 117   |
| 6     | "      | "     | "     | 13.5  | 132   |
| 7     | "      | "     | "     | 15    | 146   |
| 8     | "      | "     | 10    | 14.5  | 161   |
| 9     | "      | "     | "     | 14.5  | 176   |
| 10    | "      | "     | "     | 14.5  | 190   |
| 11    | "      | "     | "     | 14.5  | 205   |
| 12    | "      | 80    | 9.5   | 14.5  | 220   |
| 1 PM  | "      | "     | "     | 14.5  | 232   |
| 2     | "      | "     | "     | 14    | 247   |
| 3     | "      | "     | "     | 14    | 261   |
| 4     | "      | 71    | "     | 14    | 276   |
| 5     | "      | "     | "     | 14.5  | 290   |
| 6     | "      | "     | "     | 14.5  | 305   |
| 7     | "      | "     | "     | 14.5  | 319   |
| 8     | "      | "     | "     | 14    | 333   |
| 9     | 1170   | 80    | 9     | 14    | 347   |
| 10    | "      | "     | "     | 14    | 361   |

5<sup>th</sup> time  
in knots  
left on.

Aug. 4

*General Bath*  
*added.*

August 4, 20 —  
 added 10 cc General Bath

Aug. 5, 20. —  
 added 20 cc General Bath

Aug. 4, 20. #2 Bath

| TIME | Spr. Temp | Volts | Amp. | Total |
|------|-----------|-------|------|-------|
| 11   | 17.0      | 8.0   | 9.1  | 361   |
| 12   | "         | "     | "    | 375   |
| 1/4  | "         | "     | "    | 389   |
| 2    | "         | "     | 9.5  | 402   |
| 3    | "         | "     | "    | 418   |
| 4    | "         | "     | "    | 432   |
| 5    | "         | "     | 9.5  | 446   |
| 6    | "         | "     | "    | 460   |
| 7    | "         | "     | 4    | 474   |
| 8    | "         | "     | "    | 488   |
| 9    | "         | "     | "    | 502   |
| 10   | "         | "     | "    | 516   |
| 11   | "         | "     | "    | 530   |
| 12   | "         | "     | "    | 544   |
| 1/4  | "         | "     | "    | 558   |
| 2    | "         | "     | "    | 572   |
| 3    | "         | "     | 8.3  | 586   |
| 4    | "         | "     | "    | 600   |
| 5    | "         | "     | "    | 614   |
| 6    | "         | "     | "    | 628   |
| 7    | "         | "     | "    | 642   |
| 8    | "         | "     | "    | 656   |
| 9    | "         | "     | 9    | 670   |
| 10   | "         | "     | "    | 680   |
| 11   | "         | "     | "    | 696   |
| 12   | "         | "     | "    | 710   |

Rubber barrel  
 #16

5th time in  
 knots left on

Aug 5, 20

50/200/14  
 250

cut

# # 8 Batter Rubberdamish

Start Aug 3, 20 at 5 PM # 20

| TIME | Sp. W | Temp | Volt | Amper | Feet |                                   |
|------|-------|------|------|-------|------|-----------------------------------|
| 5 PM | 11/16 | 84   | 8.5  | 16    |      |                                   |
| 6    | "     | "    | "    | 16.5  | 16   | 2nd time in<br>terropts not taken |
| 7    | "     | "    | "    | 16.5  | 33   | off.                              |
| 8    | "     | "    | 10   | 15.5  | 18   |                                   |
| 9    | "     | "    | "    | 15.5  | 64   |                                   |
| 10   | "     | "    | "    | 15.5  | 79   |                                   |
| 11   | "     | "    | "    | 15.5  | 15   |                                   |
| 12   | "     | 80   | 9.5  | 15.5  | 115  |                                   |
| 1 PM | "     | "    | "    | 15.5  | 136  |                                   |
| 2    | "     | "    | "    | 15.5  | 141  |                                   |
| 3    | "     | "    | "    | 15.5  | 141  |                                   |
| 4    | "     | "    | "    | 15.5  | 141  |                                   |
| 5    | "     | "    | "    | 15.5  | 141  |                                   |
| 6    | "     | "    | "    | 15.5  | 141  |                                   |
| 7    | "     | "    | "    | 15.5  | 141  |                                   |
| 8    | "     | "    | "    | 15.5  | 141  |                                   |
| 9    | 1170  | 80   | 9.   | 15    | 232  |                                   |
| 10   | "     | "    | "    | 15    | 247  |                                   |
| 11   | "     | "    | "    | 15    | 262  |                                   |
| 12   | "     | "    | "    | 15    | 277  |                                   |
| 1 PM | "     | "    | "    | 15    | 292  |                                   |
| 2    | "     | "    | 9.5  | 15    | 307  |                                   |
| 3    | "     | "    | "    | 14.5  | 321  |                                   |
| 4    | "     | "    | "    | 14.5  | 336  |                                   |
| 5    | "     | "    | "    | 15    | 351  |                                   |
|      | "     | "    | "    | 15.5  | 366  |                                   |

Aug. 4, 20

# 8 Bath

Rubberdam

#20

| TIME  | Spgr  | Temp | Volts | Amph | Total |
|-------|-------|------|-------|------|-------|
| 6     | 11.70 | 80   | 9.5   | 15   | 381   |
| 7     | "     | "    | "     | 15   | 390   |
| 8     | "     | "    | "     | 15   | 411   |
| 9     | "     | "    | "     | 15   | 426   |
| 10    | "     | "    | "     | 15   | 441   |
| 11    | "     | "    | "     | 15   | 456   |
| 12    | "     | "    | "     | 15   | 471   |
| 1 1/4 | "     | "    | "     | 15   | 486   |
| 2     | "     | "    | "     | 15   | 501   |
| 3     | "     | "    | 8.9   | 15   | 516   |
| 4     | "     | "    | "     | 15   | 531   |
| 5     | "     | "    | "     | 15   | 546   |
| 6     | "     | "    | "     | 15   | 561   |
| 7     | "     | "    | "     | 15   | 576   |
| 8     | "     | "    | 8.0   | 15   | 590   |
| 9     | "     | "    | "     | 15   | 605   |
| 10    | "     | "    | "     | 15   | 620   |
| 11    | "     | "    | "     | 15   | 635   |
| 12    | "     | "    | "     | 15   | 650   |
| 1     | "     | "    | "     | 15   | 665   |
| 2     | "     | "    | "     | 15   | 680   |
| 3     | "     | "    | "     | 15   | 695   |
| 4     | "     | "    | "     | 15   | 710   |
| 5     | "     | "    | "     | 15   | 725   |
| 6     | "     | "    | "     | 15   | 740   |
| 7     | "     | "    | "     | 15   | 755   |

~~Aug 15, 30.~~  
Aug 15, 30.

49/100 %

Out

25/11/1  
22 #2

Added general bath drops

Aug 4 = 10 cc to Copper bath  
 " 5 = 20 cc " " "  
 " 6 = 40 cc " " "  
 " 7 = 40 cc " " "  
 " 8 = 40 cc " " "  
 " 9 = 40 cc " " "  
 " 10 = 40 cc " " "  
 " 11 = 40 cc " " "  
 " 12 = 40 cc " " "

Mr Edison's Permission to stop adding  
 general bath drops till further order  
 because center of disc is burnt at point  
 of copper plate

# 4 Baths August 8

| TIME  | Temp  | Volts | Amps | Total |
|-------|-------|-------|------|-------|
| 12 AM | 117.5 | 8.5   | 9    | 17.5  |
| 12    | 117.5 | 8.5   | 9    | 17    |
| 1     | "     | "     | "    | 17    |
| 2     | "     | "     | "    | 17    |
| 3     | "     | "     | "    | 17    |
| 4     | "     | "     | "    | 17    |
| 5     | "     | "     | "    | 16    |
| 6     | "     | "     | "    | 15    |
| 7     | "     | "     | "    | 15    |
| 8     | "     | "     | "    | 15    |
| 9     | 1190  | 80    | 9    | 15.5  |
| 10    | "     | "     | "    | 15.5  |
| 11    | "     | "     | "    | 15.5  |
| 12    | "     | "     | "    | 15.5  |
| 1     | "     | "     | "    | 15.5  |
| 2     | "     | "     | "    | 15.5  |
| 3     | "     | "     | "    | 15.5  |
| 4     | "     | "     | "    | 15.5  |
| 5     | "     | "     | "    | 15.5  |
| 6     | "     | "     | "    | 15.5  |
| 7     | "     | "     | "    | 15.5  |
| 8     | "     | "     | "    | 15.5  |
| 9     | "     | "     | "    | 15.5  |
| 10    | "     | "     | "    | 15.5  |
| 11    | "     | "     | "    | 15.5  |
| 12    | "     | "     | "    | 15.5  |

Exp 28 #5  
 #1 note  
 pig in wire  
 full em  
 not on  
 after 70  
 about 100  
 in the bath  
 to be given  
 750 hr  
 in Copper  
 and ~~not~~ ~~not~~  
 This will  
 make 29<sup>th</sup>  
 strips  
 John's talk  
 mold

# #4 Bath Continued

| Time | Sp. Gr. | Temp. | Voltage | Amperes | Total |
|------|---------|-------|---------|---------|-------|
| 12   | 1.170   | 80    | 9       | 16      | 397   |
| 1 PM | "       | "     | "       | 16      | 483   |
| 2    | "       | "     | "       | 16      | 419   |
| 3    | "       | "     | "       | 16      | 435   |
| 4    | "       | "     | "       | 16      | 451   |
| 5    | "       | "     | "       | 16      | 467   |
| 6    | "       | "     | "       | 16      | 483   |
| 7    | "       | "     | "       | 16      | 499   |
| 8    | "       | "     | "       | 16      | 505   |
| 9    | "       | "     | "       | 16.5    | 521   |
| 10   | "       | "     | "       | 16.5    | 538   |
| 11   | "       | "     | "       | 16.5    | 554   |
| 12   | "       | "     | "       | 16.5    | 571   |
| 1 PM | "       | 82    | "       | 16.5    | 587   |
| 2    | "       | "     | "       | 15.5    | 603   |
| 3    | "       | "     | "       | 15.5    | 618   |
| 4    | "       | "     | "       | 15.5    | 634   |
| 5    | "       | "     | "       | 15.5    | 649   |
| 6    | "       | 85    | "       | 15.5    | 665   |
| 7    | "       | "     | "       | 15.5    | 681   |
| 8    | "       | "     | "       | 15.5    | 696   |
| 9    | 1.170   | 82    | "       | 16.5    | 712   |
| 10   | "       | "     | "       | 16.5    | 728   |
| 11   | "       | "     | "       | 16.5    | 744   |

Exp 25 #B  
Chas. R.

Aug. 10, 20

Cont

# # LaBath Aug 8<sup>th</sup>

| Aug 8 <sup>th</sup> | 11 AM | Temp | Volts | Amps | Time |
|---------------------|-------|------|-------|------|------|
| 11 AM               | 11.5  | 85   | 9     | 14   |      |
| 12                  | "     | "    | "     | 13.5 | 14   |
| 1 PM                | "     | "    | "     | 13.5 | 27   |
| 2                   | "     | "    | "     | 13.5 | 41   |
| 3                   | "     | "    | "     | 13   | 54   |
| 4                   | "     | "    | "     | 13   | 67   |
| 5                   | "     | "    | "     | 13   | 80   |
| 6                   | "     | "    | "     | 13   | 93   |
| 7                   | "     | "    | "     | 13   | 106  |
| 8                   | "     | "    | "     | 13   | 119  |
| 9                   | "     | "    | "     | 13.5 | 133  |
| 10                  | "     | "    | "     | 13.5 | 148  |
| 11                  | "     | "    | "     | 13.5 | 162  |
| 12 PM               | "     | "    | "     | 13.5 | 175  |
| 1                   | "     | "    | "     | 13.5 | 188  |
| 2                   | "     | "    | "     | 14   | 202  |
| 3                   | "     | "    | "     | 14   | 216  |
| 4                   | "     | "    | "     | 13.5 | 230  |
| 5                   | "     | "    | "     | 14   | 244  |
| 6                   | "     | "    | "     | 14   | 258  |
| 7                   | "     | "    | "     | 14   | 272  |
| 8                   | "     | "    | "     | 14   | 286  |
| 9                   | "     | "    | "     | N    | 300  |
| 10                  | "     | "    | "     | "    | 314  |
| 11                  | "     | "    | "     | "    | 328  |

294-2  
 # 2 No. 10  
 removed  
 Aug 8<sup>th</sup>  
 10:45 PM  
 got in with  
 full current  
 on at 11  
 77 amp  
 up to 100  
 No. 10  
 after 28  
 stop  
 full  
 made 2  
 stop  
 100  
 back to 100  
 as 77  
 7 amp  
 taken



# 2 Cu Bath Eggs 29-33

| Time  | Sp. Gr. | Temp. | Volts | Amp. | Total |
|-------|---------|-------|-------|------|-------|
| 12    | 110     | 80    | 9     | 14   | 342   |
| 1 PM  | "       | "     | "     | 14   | 354   |
| 2     | "       | "     | "     | 14   | 368   |
| 3     | "       | "     | "     | 14   | 382   |
| 4     | "       | "     | "     | 14   | 396   |
| 5     | "       | "     | "     | 14   | 410   |
| 6     | "       | "     | "     | 14   | 424   |
| 7     | "       | "     | "     | 14   | 438   |
| 8     | "       | "     | "     | 14   | 452   |
| 9     | "       | "     | "     | 14   | 466   |
| 10    | "       | "     | "     | 14   | 480   |
| 11    | "       | "     | "     | 14   | 494   |
| 12    | "       | "     | "     | 14   | 508   |
| 1 AM  | "       | 82    | "     | 14   | 522   |
| 2     | "       | "     | "     | 14   | 536   |
| 3     | "       | "     | "     | 14   | 550   |
| 4     | "       | "     | "     | 14   | 564   |
| 5     | "       | "     | "     | 14   | 578   |
| 6     | "       | 85    | "     | 14   | 592   |
| 7     | "       | "     | "     | 14   | 606   |
| 8     | "       | "     | "     | 14   | 620   |
| 9     | 1170    | 82    | "     | 14   | 634   |
| 10    | "       | "     | "     | 14   | 648   |
| 11    | "       | "     | "     | 14   | 662   |
| 12 AM | "       | "     | "     | 14   | 676   |
| 1     | "       | "     | "     | 14   | 690   |
| 2     | "       | "     | "     | 14   | 704   |
| 3     | "       | "     | "     | 14   | 718   |
| 4     | "       | "     | "     | 14   | 732   |

Aug 30, 20.

Out

# # 4 Bath Cu

Start Aug. 11 20 @ 10 AM.

Eysl # 35 AB

| Time  | Sp. Ar | Temp | V. Hts | Amps | Total |
|-------|--------|------|--------|------|-------|
| 10 AM | 1165   | 82   | 8.5    | 145  | 14    |
| 11    | "      | "    | "      | 145  | 29    |
| 12    | 1170   | 80   | "      | 145  | 43    |
| 1 PM  | "      | "    | "      | 145  | 58    |
| 2     | "      | "    | 8.5    | 145  | 72    |
| 3     | "      | "    | "      | 144  | 86    |
| 4     | "      | "    | "      | 144  | 100   |
| 5     | "      | "    | "      | 144  | 114   |
| 6     | "      | "    | "      | 144  | 128   |
| 7     | "      | "    | "      | 144  | 142   |
| 8     | "      | "    | "      | 144  | 156   |
| 9     | "      | "    | "      | 144  | 170   |
| 10    | "      | "    | "      | 144  | 184   |
| 11    | "      | "    | "      | 144  | 198   |
| 12    | "      | "    | "      | 144  | 212   |
| 1 PM  | "      | "    | "      | 144  | 226   |
| 2     | "      | "    | "      | 144  | 240   |
| 3     | "      | "    | "      | 144  | 254   |
| 4     | "      | "    | "      | 144  | 268   |
| 5     | "      | "    | 9      | 144  | 282   |
| 6     | "      | "    | "      | 144  | 296   |
| 7     | "      | "    | "      | 144  | 310   |
| 8     | "      | 11   | 8.5    | 144  | 324   |
| 9     | "      | "    | "      | 144  | 338   |
| 10    | "      | "    | "      | 144  |       |

Transfer from  
# 2 to Bath  
103 am for,  
This piece not  
polished.

Aug. 12, 20

#4 Bath Cu.

#35 AB

| TIME           | Temp | Temp | Volts | Amps | Total |
|----------------|------|------|-------|------|-------|
| Aug 12 - 11 AM | 1170 | 80   | 8.5   | 14   | 352   |
| 12 PM          | "    | "    | "     | 15   | 378   |
| 1              | "    | "    | "     | 13   | 404   |
| 2              | "    | "    | "     | 14   | 432   |
| 3              | "    | "    | "     | 14.5 | 471   |
| 4              | "    | "    | "     | 14.5 | 500   |
| 5              | "    | "    | "     | 14.5 | 524   |
| 6              | "    | "    | "     | 15   | 559   |
| 7              | "    | "    | "     | 15   | 589   |
| 8              | "    | "    | "     | 15   | 619   |
| 9              | "    | "    | "     | 15   | 649   |
| 10             | "    | "    | "     | 15   | 679   |
| 11             | "    | "    | "     | 15   | 707   |
| 12 PM          | "    | "    | "     | 14   | 735   |
| 1              | "    | "    | "     | 14   | 763   |

Out

#2 Bath Cu

Exp #36 AB

|       |               |      |        |             |       |                |
|-------|---------------|------|--------|-------------|-------|----------------|
| AM    | Start Aug. 11 | 20 @ | 10 PM. | Exp # 364-B |       |                |
| Time  | 8.5           | Temp | Volts  | Amps        | Total | Transfer from  |
| 10 AM | 1165          | 82   | 8.5    | 13.         | 13.   | # 1. m. bath   |
| 11    | "             | "    | "      | 13.         | 13    | 105 Amps       |
| 12    | 1170          | 80   | "      | 13          | 26    | This disc not  |
| 1 PM  | "             | "    | "      | 13          | 39    | polished       |
| 2     | "             | "    | 8.5    | 13          | 52    |                |
| 3     | "             | "    | "      | 13          | 65    | Center of disc |
| 4     | "             | "    | "      | 13          | 78    | in Copper bath |
| 5     | "             | "    | "      | 13          | 91    | looks like     |
| 6     | "             | "    | "      | 13          | 104   | porous plate   |
| 7     | "             | "    | "      | 13          | 117   |                |
| 8     | "             | "    | "      | 13          | 130   |                |
| 9     | "             | "    | "      | 13          | 143   |                |
| 10    | "             | "    | "      | 13          | 156   |                |
| 11    | "             | "    | "      | 13          | 169   |                |
| 12    | "             | "    | "      | 13          | 182   |                |
| 1 PM  | "             | "    | "      | 13          | 195   |                |
| 2     | "             | "    | "      | 13          | 208   |                |
| 3     | "             | "    | "      | 13          | 221   |                |
| 4     | "             | "    | "      | 13          | 234   |                |
| 5     | "             | "    | "      | 13          | 247   |                |
| 6     | "             | "    | 9      | 13          | 260   |                |
| 7     | "             | "    | "      | 13          | 273   |                |
| 8     | "             | "    | "      | 13          | 288   |                |
| 9     | "             | "    | 8.5    | 13          | 302   |                |
| 10    | "             | "    | "      | 13          | 315   |                |
| 11    | "             | "    | "      | 13          | 329   |                |
| 12    | "             | "    | "      | 13          | 342   |                |
| 1 PM  | "             | "    | "      | 13          | 356   |                |

Aug 12, 20.

# #2 Bath Cu Ep 364B

| TIME | Sp. A. Temp | Volt | Amp  | Total |
|------|-------------|------|------|-------|
| 2    | 1170        | 8.5  | 13   | 369   |
| 3    | "           | "    | 13   | 395   |
| 4    | "           | "    | 13   | 421   |
| 5    | "           | "    | 13.5 | 450   |
| 6    | "           | "    | 13.5 | 477   |
| 7    | "           | "    | 13.5 | 504   |
| 8    | "           | "    | 13.5 | 518   |
| 9    | "           | "    | 13.5 | 548   |
| 10   | "           | "    | 13.5 | 578   |
| 11   | "           | "    | 13.5 | 608   |
| 12   | "           | "    | 13.5 | 636   |
| 1    | "           | "    | 13.5 | 664   |
| 2    | "           | "    | 13.5 | 691   |
| 3    | "           | "    | 13.5 | 718   |
| 4    | "           | "    | 13.5 | 745   |
| 5    | "           | "    | 13.5 | 778   |
| 6    | "           | "    | 13.5 | 778   |

Aug 13-

Out

# #5 Cu Bath

Standard Aug 11, 20 @ 8 PM

| TIME   | Sp. A. Temp | Volt | Amp | Total |
|--------|-------------|------|-----|-------|
| 8 P.M. | 1170        | 8.5  | 12  | 12    |
| 9      | "           | "    | 12  | 24    |
| 10     | "           | "    | 12  | 36    |
| 11     | "           | "    | 12  | 48    |
| 12     | "           | "    | 12  | 60    |
| 1 PM   | "           | "    | 12  | 72    |
| 2      | "           | "    | 12  | 84    |
| 3      | "           | "    | 12  | 96    |
| 4      | "           | "    | 12  | 108   |
| 5      | "           | "    | 12  | 119   |
| 6      | "           | "    | 12  | 131   |
| 7      | "           | "    | 12  | 142   |
| 8      | "           | "    | 12  | 154   |
| 9      | "           | "    | 12  | 166   |
| 10     | "           | "    | 12  | 178   |
| 11     | "           | "    | 12  | 190   |
| 12     | "           | "    | 12  | 202   |
| 1 PM   | "           | "    | 12  | 214   |
| 2      | "           | "    | 12  | 226   |
| 3      | "           | "    | 12  | 238   |
| 4      | "           | "    | 12  | 250   |
| 5      | "           | "    | 12  | 262   |
| 6      | "           | "    | 12  | 274   |
| 7      | "           | "    | 12  | 286   |
| 8      | "           | "    | 12  | 298   |

Ep 374B

Castanode &  
Mable screen  
Transfer front  
1 m Bath  
Polished disc

Aug 12, 20.

# #5 Bath Cw. Exp 37A-B.

| TIME | Sp.  | Temp | Volts | Temp | Total |
|------|------|------|-------|------|-------|
| 9    | 1170 | 80   | 9     | 12   | 308   |
| 10   | "    | "    | "     | 12   | 332   |
| 11   | "    | "    | "     | 12   | 358   |
| 12   | 1170 | 80   | 9.5   | 12   | 382   |
| 1    | "    | "    | "     | 13   | 408   |
| 2    | "    | "    | "     | 13   | 434   |
| 3    | "    | "    | "     | 13   | 460   |
| 4    | "    | "    | 9     | 13   | 484   |
| 5    | "    | "    | "     | 12   | 508   |
| 6    | "    | "    | "     | 12   | 532   |
| 7    | "    | "    | "     | 12   | 556   |
| 8    | "    | "    | "     | 12   | 580   |
| 9    | "    | "    | "     | 12   | 604   |
| 10   | "    | "    | "     | 12   | 628   |
| 11   | "    | "    | "     | 12   | 652   |
| 12   | "    | "    | "     | 12   | 676   |
| 1    | "    | "    | "     | 12   | 700   |
| 2    | "    | "    | "     | 12   | 724   |
| 3    | "    | "    | "     | 12   | 748   |

Out

# #6 Cw. Bath

Start Aug. 11, 2001 8 P.M.

| TIME | Sp.  | Temp | Volts | Temp | Total |
|------|------|------|-------|------|-------|
| 8 PM | 1170 | 80   | 8.5   | 14   | 14    |
| 9    | "    | "    | "     | 14   | 28    |
| 10   | "    | "    | "     | 14   | 42    |
| 11   | "    | "    | "     | 14   | 56    |
| 12   | 1 AM | "    | "     | 14   | 70    |
| 1    | "    | "    | "     | 14   | 84    |
| 2    | "    | "    | "     | 14   | 98    |
| 3    | "    | "    | "     | 14   | 112   |
| 4    | "    | "    | "     | 13   | 126   |
| 5    | "    | "    | "     | 12   | 140   |
| 6    | "    | "    | "     | 12   | 154   |
| 7    | "    | "    | "     | 12   | 168   |
| 8    | "    | "    | "     | 12   | 182   |
| 9    | "    | "    | "     | 12   | 196   |
| 10   | "    | "    | "     | 12   | 210   |
| 11   | 1 PM | "    | "     | 12   | 224   |
| 12   | "    | "    | "     | 12   | 238   |
| 1    | "    | "    | "     | 12   | 252   |
| 2    | "    | "    | "     | 12   | 266   |
| 3    | "    | "    | "     | 12   | 280   |
| 4    | "    | "    | "     | 12   | 294   |
| 5    | "    | "    | "     | 12   | 308   |
| 6    | "    | "    | "     | 12   | 322   |
| 7    | "    | "    | "     | 12   | 336   |
| 8    | "    | "    | "     | 12   | 350   |
| 9    | "    | "    | "     | 12   | 364   |
| 10   | "    | "    | "     | 12   | 378   |
| 11   | "    | "    | "     | 12   | 392   |
| 12   | 1 PM | "    | 9     | 12   | 354   |
| 1    | "    | "    | 9.5   | 12   | 366   |
| 2    | "    | "    | "     | 12   | 378   |
| 3    | "    | "    | "     | 12   | 390   |

Exp #38A-B

Left anode  
+ Maple piston  
Transferred from  
#2 H. Bath.  
Polished disc.

Aug. 12, 20.

Aug. 13, 20

#6 Cu Bath

Epo 38H-B

| TIME   | 89g  | Temp | Volt | Amp  | Total |
|--------|------|------|------|------|-------|
| S.A.M. | 1170 | 80   | 9.5  | 12.5 | 403   |
| 600    | "    | "    | "    | 12.5 | 415   |
| 700    | "    | "    | "    | 12.5 | 428   |
| 800    | "    | "    | 9    | 12   | 440   |
| 900    | "    | "    | 8.5  | 11   | 451   |
| 10     | "    | "    | "    | 12.5 | 468   |
| 11     | "    | "    | "    | 12.5 | 476   |
| 12     | "    | "    | 11   | 12.5 | 489   |
| 1 P.M. | "    | "    | "    | 12.5 | 504   |
| 2      | "    | "    | "    | 12.5 | 539   |
| 3      | "    | "    | "    | 12.5 | 564   |
| 4      | "    | "    | "    | 12.5 | 589   |
| 5      | "    | "    | "    | 12.5 | 614   |
| 6      | "    | "    | "    | 12.5 | 639   |
| 7      | "    | "    | "    | 12.5 | 664   |
| 8      | "    | "    | "    | 12.5 | 689   |
| 9      | "    | "    | "    | 12.5 | 714   |
| 10     | "    | "    | "    | 12.5 | 739   |
| 11     | "    | "    | "    | 12.5 | 754   |
| 12     | "    | "    | "    | 12.5 | 779   |
| 1 P.M. | "    | "    | "    | 12.5 | 794   |
| 2      | "    | "    | "    | 12.5 | 819   |
| 3      | "    | "    | "    | 12.5 | 844   |
| 4      | "    | "    | "    | 12.5 | 869   |
| 5      | "    | "    | "    | 12.5 | 894   |
| 6      | "    | "    | "    | 12.5 | 919   |
| 7      | "    | "    | "    | 12.5 | 944   |
| 8      | "    | "    | "    | 12.5 | 969   |
| 9      | "    | "    | "    | 12.5 | 994   |
| 10     | "    | "    | "    | 12.5 | 1019  |
| 11     | "    | "    | "    | 12.5 | 1044  |
| 12     | "    | "    | "    | 12.5 | 1069  |
| 1 P.M. | "    | "    | "    | 12.5 | 1094  |
| 2      | "    | "    | "    | 12.5 | 1119  |
| 3      | "    | "    | "    | 12.5 | 1144  |
| 4      | "    | "    | "    | 12.5 | 1169  |
| 5      | "    | "    | "    | 12.5 | 1194  |
| 6      | "    | "    | "    | 12.5 | 1219  |
| 7      | "    | "    | "    | 12.5 | 1244  |
| 8      | "    | "    | "    | 12.5 | 1269  |
| 9      | "    | "    | "    | 12.5 | 1294  |
| 10     | "    | "    | "    | 12.5 | 1319  |
| 11     | "    | "    | "    | 12.5 | 1344  |
| 12     | "    | "    | "    | 12.5 | 1369  |
| 1 P.M. | "    | "    | "    | 12.5 | 1394  |
| 2      | "    | "    | "    | 12.5 | 1419  |
| 3      | "    | "    | "    | 12.5 | 1444  |
| 4      | "    | "    | "    | 12.5 | 1469  |
| 5      | "    | "    | "    | 12.5 | 1494  |
| 6      | "    | "    | "    | 12.5 | 1519  |
| 7      | "    | "    | "    | 12.5 | 1544  |
| 8      | "    | "    | "    | 12.5 | 1569  |
| 9      | "    | "    | "    | 12.5 | 1594  |
| 10     | "    | "    | "    | 12.5 | 1619  |
| 11     | "    | "    | "    | 12.5 | 1644  |
| 12     | "    | "    | "    | 12.5 | 1669  |
| 1 P.M. | "    | "    | "    | 12.5 | 1694  |
| 2      | "    | "    | "    | 12.5 | 1719  |
| 3      | "    | "    | "    | 12.5 | 1744  |
| 4      | "    | "    | "    | 12.5 | 1769  |
| 5      | "    | "    | "    | 12.5 | 1794  |
| 6      | "    | "    | "    | 12.5 | 1819  |
| 7      | "    | "    | "    | 12.5 | 1844  |
| 8      | "    | "    | "    | 12.5 | 1869  |
| 9      | "    | "    | "    | 12.5 | 1894  |
| 10     | "    | "    | "    | 12.5 | 1919  |
| 11     | "    | "    | "    | 12.5 | 1944  |
| 12     | "    | "    | "    | 12.5 | 1969  |
| 1 P.M. | "    | "    | "    | 12.5 | 1994  |
| 2      | "    | "    | "    | 12.5 | 2019  |
| 3      | "    | "    | "    | 12.5 | 2044  |
| 4      | "    | "    | "    | 12.5 | 2069  |
| 5      | "    | "    | "    | 12.5 | 2094  |
| 6      | "    | "    | "    | 12.5 | 2119  |
| 7      | "    | "    | "    | 12.5 | 2144  |
| 8      | "    | "    | "    | 12.5 | 2169  |
| 9      | "    | "    | "    | 12.5 | 2194  |
| 10     | "    | "    | "    | 12.5 | 2219  |
| 11     | "    | "    | "    | 12.5 | 2244  |
| 12     | "    | "    | "    | 12.5 | 2269  |
| 1 P.M. | "    | "    | "    | 12.5 | 2294  |
| 2      | "    | "    | "    | 12.5 | 2319  |
| 3      | "    | "    | "    | 12.5 | 2344  |
| 4      | "    | "    | "    | 12.5 | 2369  |
| 5      | "    | "    | "    | 12.5 | 2394  |
| 6      | "    | "    | "    | 12.5 | 2419  |
| 7      | "    | "    | "    | 12.5 | 2444  |
| 8      | "    | "    | "    | 12.5 | 2469  |
| 9      | "    | "    | "    | 12.5 | 2494  |
| 10     | "    | "    | "    | 12.5 | 2519  |
| 11     | "    | "    | "    | 12.5 | 2544  |
| 12     | "    | "    | "    | 12.5 | 2569  |
| 1 P.M. | "    | "    | "    | 12.5 | 2594  |
| 2      | "    | "    | "    | 12.5 | 2619  |
| 3      | "    | "    | "    | 12.5 | 2644  |
| 4      | "    | "    | "    | 12.5 | 2669  |
| 5      | "    | "    | "    | 12.5 | 2694  |
| 6      | "    | "    | "    | 12.5 | 2719  |
| 7      | "    | "    | "    | 12.5 | 2744  |
| 8      | "    | "    | "    | 12.5 | 2769  |
| 9      | "    | "    | "    | 12.5 | 2794  |
| 10     | "    | "    | "    | 12.5 | 2819  |
| 11     | "    | "    | "    | 12.5 | 2844  |
| 12     | "    | "    | "    | 12.5 | 2869  |
| 1 P.M. | "    | "    | "    | 12.5 | 2894  |
| 2      | "    | "    | "    | 12.5 | 2919  |
| 3      | "    | "    | "    | 12.5 | 2944  |
| 4      | "    | "    | "    | 12.5 | 2969  |
| 5      | "    | "    | "    | 12.5 | 2994  |
| 6      | "    | "    | "    | 12.5 | 3019  |
| 7      | "    | "    | "    | 12.5 | 3044  |
| 8      | "    | "    | "    | 12.5 | 3069  |
| 9      | "    | "    | "    | 12.5 | 3094  |
| 10     | "    | "    | "    | 12.5 | 3119  |
| 11     | "    | "    | "    | 12.5 | 3144  |
| 12     | "    | "    | "    | 12.5 | 3169  |
| 1 P.M. | "    | "    | "    | 12.5 | 3194  |
| 2      | "    | "    | "    | 12.5 | 3219  |
| 3      | "    | "    | "    | 12.5 | 3244  |
| 4      | "    | "    | "    | 12.5 | 3269  |
| 5      | "    | "    | "    | 12.5 | 3294  |
| 6      | "    | "    | "    | 12.5 | 3319  |
| 7      | "    | "    | "    | 12.5 | 3344  |
| 8      | "    | "    | "    | 12.5 | 3369  |
| 9      | "    | "    | "    | 12.5 | 3394  |
| 10     | "    | "    | "    | 12.5 | 3419  |
| 11     | "    | "    | "    | 12.5 | 3444  |
| 12     | "    | "    | "    | 12.5 | 3469  |
| 1 P.M. | "    | "    | "    | 12.5 | 3494  |
| 2      | "    | "    | "    | 12.5 | 3519  |
| 3      | "    | "    | "    | 12.5 | 3544  |
| 4      | "    | "    | "    | 12.5 | 3569  |
| 5      | "    | "    | "    | 12.5 | 3594  |
| 6      | "    | "    | "    | 12.5 | 3619  |
| 7      | "    | "    | "    | 12.5 | 3644  |
| 8      | "    | "    | "    | 12.5 | 3669  |
| 9      | "    | "    | "    | 12.5 | 3694  |
| 10     | "    | "    | "    | 12.5 | 3719  |
| 11     | "    | "    | "    | 12.5 | 3744  |
| 12     | "    | "    | "    | 12.5 | 3769  |
| 1 P.M. | "    | "    | "    | 12.5 | 3794  |
| 2      | "    | "    | "    | 12.5 | 3819  |
| 3      | "    | "    | "    | 12.5 | 3844  |
| 4      | "    | "    | "    | 12.5 | 3869  |
| 5      | "    | "    | "    | 12.5 | 3894  |
| 6      | "    | "    | "    | 12.5 | 3919  |
| 7      | "    | "    | "    | 12.5 | 3944  |
| 8      | "    | "    | "    | 12.5 | 3969  |
| 9      | "    | "    | "    | 12.5 | 3994  |
| 10     | "    | "    | "    | 12.5 | 4019  |
| 11     | "    | "    | "    | 12.5 | 4044  |
| 12     | "    | "    | "    | 12.5 | 4069  |
| 1 P.M. | "    | "    | "    | 12.5 | 4094  |
| 2      | "    | "    | "    | 12.5 | 4119  |
| 3      | "    | "    | "    | 12.5 | 4144  |
| 4      | "    | "    | "    | 12.5 | 4169  |
| 5      | "    | "    | "    | 12.5 | 4194  |
| 6      | "    | "    | "    | 12.5 | 4219  |
| 7      | "    | "    | "    | 12.5 | 4244  |
| 8      | "    | "    | "    | 12.5 | 4269  |
| 9      | "    | "    | "    | 12.5 | 4294  |
| 10     | "    | "    | "    | 12.5 | 4319  |
| 11     | "    | "    | "    | 12.5 | 4344  |
| 12     | "    | "    | "    | 12.5 | 4369  |
| 1 P.M. | "    | "    | "    | 12.5 | 4394  |
| 2      | "    | "    | "    | 12.5 | 4419  |
| 3      | "    | "    | "    | 12.5 | 4444  |
| 4      | "    | "    | "    | 12.5 | 4469  |
| 5      | "    | "    | "    | 12.5 | 4494  |
| 6      | "    | "    | "    | 12.5 | 4519  |
| 7      | "    | "    | "    | 12.5 | 4544  |
| 8      | "    | "    | "    | 12.5 | 4569  |
| 9      | "    | "    | "    | 12.5 | 4594  |
| 10     | "    | "    | "    | 12.5 | 4619  |
| 11     | "    | "    | "    | 12.5 | 4644  |
| 12     | "    | "    | "    | 12.5 | 4669  |
| 1 P.M. | "    | "    | "    | 12.5 | 4694  |
| 2      | "    | "    | "    | 12.5 | 4719  |
| 3      | "    | "    | "    | 12.5 | 4744  |
| 4      | "    | "    | "    | 12.5 | 4769  |
| 5      | "    | "    | "    | 12.5 | 4794  |
| 6      | "    | "    | "    | 12.5 | 4819  |
| 7      | "    | "    | "    | 12.5 | 4844  |
| 8      | "    | "    | "    | 12.5 | 4869  |
| 9      | "    | "    | "    | 12.5 | 4894  |
| 10     | "    | "    | "    | 12.5 | 4919  |
| 11     | "    | "    | "    | 12.5 | 4944  |
| 12     | "    | "    | "    | 12.5 | 4969  |
| 1 P.M. | "    | "    | "    | 12.5 | 4994  |
| 2      | "    | "    | "    | 12.5 | 5019  |
| 3      | "    | "    | "    | 12.5 | 5044  |
| 4      | "    | "    | "    | 12.5 | 5069  |
| 5      | "    | "    | "    | 12.5 | 5094  |
| 6      | "    | "    | "    | 12.5 | 5119  |
| 7      | "    | "    | "    | 12.5 | 5144  |
| 8      | "    | "    | "    | 12.5 | 5169  |
| 9      | "    | "    | "    | 12.5 | 5194  |
| 10     | "    | "    | "    | 12.5 | 5219  |
| 11     | "    | "    | "    | 12.5 | 5244  |
| 12     | "    | "    | "    | 12.5 | 5269  |
| 1 P.M. | "    | "    | "    | 12.5 | 5294  |
| 2      | "    | "    | "    | 12.5 | 5319  |
| 3      | "    | "    | "    | 12.5 | 5344  |
| 4      | "    | "    | "    | 12.5 | 5369  |
| 5      | "    | "    | "    | 12.5 | 5394  |
| 6      | "    | "    | "    | 12.5 | 5419  |
| 7      | "    | "    | "    | 12.5 | 5444  |
| 8      | "    | "    | "    | 12.5 | 5469  |
| 9      | "    | "    | "    | 12.5 | 5494  |
| 10     | "    | "    | "    | 12.5 | 5519  |
| 11     | "    | "    | "    | 12.5 | 5544  |
| 12     | "    | "    | "    | 12.5 | 5569  |
| 1 P.M. | "    | "    | "    | 12.5 | 5594  |
| 2      | "    | "    | "    | 12.5 | 5619  |
| 3      | "    | "    | "    | 12.5 | 5644  |
| 4      | "    | "    | "    | 12.5 | 5669  |
| 5      | "    | "    | "    | 12.5 | 5694  |
| 6      | "    | "    | "    | 12.5 | 5719  |
| 7      | "    | "    | "    | 12.5 | 5744  |
| 8      | "    | "    | "    | 12.5 | 5769  |
| 9      | "    | "    | "    | 12.5 | 5794  |
| 10     | "    | "    | "    | 12.5 | 5819  |
| 11     | "    | "    | "    | 12.5 | 5844  |
| 12     | "    | "    | "    | 12.5 | 5869  |
| 1 P.M. | "    | "    | "    | 12.5 | 5894  |
| 2      | "    | "    | "    | 12.5 | 5919  |
| 3      | "    | "    | "    | 12.5 | 5944  |
| 4      | "    | "    | "    | 12.5 | 5969  |
| 5      | "    | "    | "    | 12.5 | 5994  |
| 6      | "    | "    | "    | 12.5 | 6019  |
| 7      | "    | "    | "    | 12.5 | 6044  |
| 8      | "    | "    | "    | 12.5 | 6069  |
| 9      | "    | "    | "    | 12.5 | 6094  |
| 10     | "    | "    | "    | 12.5 | 6119  |
| 11     | "    | "    | "    | 12.5 | 6144  |
| 12     | "    | "    | "    | 12.5 | 6169  |
| 1 P.M. | "    | "    | "    | 12.5 | 6194  |
| 2      | "    | "    | "    | 12.5 | 6219  |
| 3      | "    | "    | "    | 12.5 | 6244  |
| 4      | "    | "    | "    | 12.5 | 6269  |
| 5      | "    | "    | "    | 12.5 | 6294  |
| 6      | "    | "    | "    | 12.5 | 6319  |
| 7      | "    | "    | "    | 12.5 | 6344  |
| 8      | "    | "    | "    | 12.5 | 6369  |
| 9      | "    | "    | "    | 12.5 | 6394  |
| 10     | "    | "    | "    | 12.5 | 6419  |
| 11     | "    | "    | "    | 12.5 | 6444  |
| 12     | "    | "    | "    | 12.5 | 6469  |
| 1 P.M. | "    | "    | "    | 12.5 | 6494  |
| 2      | "    | "    | "    | 12.5 | 6519  |
| 3      | "    | "    | "    | 12.5 | 6544  |
| 4      | "    | "    | "    | 12.5 | 6569  |
| 5      | "    | "    | "    | 12.5 | 6594  |
| 6      | "    | "    | "    | 12.5 | 6619  |
| 7      | "    | "    | "    | 12.5 | 6644  |
| 8      | "    | "    | "    | 12.5 | 6669  |
| 9      | "    | "    | "    | 12.5 | 6694  |
| 10     | "    | "    | "    | 12.5 | 6719  |
| 11     | "    | "    | "    | 12.5 | 6744  |
| 12     | "    | "    | "    | 12.5 | 6769  |
| 1 P.M. | "    | "    | "    | 12.5 | 6794  |
| 2      | "    | "    | "    | 12.5 | 6819  |
| 3      | "    | "    | "    | 12.5 | 6844  |
| 4      | "    | "    | "    | 12.5 | 6869  |
| 5      | "    | "    | "    | 12.5 | 6894  |
| 6      | "    | "    | "    | 12.5 | 6919  |
| 7      | "    | "    | "    | 12.5 | 6944  |
| 8      | "    | "    | "    | 12.5 | 6969  |
| 9      | "    | "    | "    | 12.5 | 6994  |
| 10     | "    | "    | "    | 12.5 |       |

# # 7 Bath Ru

394B

| TIME  | Sp. g. | Temp | Voltage | Amp | Settl |
|-------|--------|------|---------|-----|-------|
| 10 PM | 1170   | 80   | 9       | 14  |       |
| 11    | "      | "    | "       | 14  | 14    |
| 12    | "      | "    | "       | 14  | 28    |
| 1     | "      | "    | "       | 14  | 42    |
| 2     | "      | "    | "       | 14  | 56    |

Out

One minute  
in the Bath  
then run for  
4 hours  
in Copper  
bath

Want to  
see if dents  
appear.

Remarks: Dents did not  
appear after stripping, but  
center was bare.

# Bath Lu

[illegible]



5 Amps for 3 min  
 then 5 Amps 1 hr  
 then to 15 Amps  
 Back up

#4 Both Cu.

Started Aug 18

| Time      | Temp | Temp | Volt | Amps | Total |
|-----------|------|------|------|------|-------|
| 10:00     | 1225 | 75   | 9    | 5    |       |
| 11:00     | "    | "    | "    | 15   | 15    |
| 12:00     | "    | "    | "    | 15   | 30    |
| avg 19-20 |      |      |      |      |       |
| 1:00      | 1225 | 75   | 9    | 15   | 45    |
| 2:00      | "    | "    | "    | 15   | 60    |
| 3:00      | "    | "    | "    | 15   | 75    |
| 4:00      | "    | "    | "    | 13   | 88    |
| 5:00      | "    | "    | "    | 11   | 99    |
| 6:00      | "    | "    | "    | 13.5 | 112.5 |
| 7:00      | "    | "    | "    | 12.5 | 125   |
| 8:00      | "    | "    | "    | 12.5 | 137.5 |
| 9-10      | "    | "    | "    | 12.5 | 150   |
| 11-       | "    | 78   | 9    | 12.5 | 162.5 |
| 12-       | "    | "    | "    | 14   | 176   |
| 1-2       | 1225 | "    | "    | 12.5 | 189   |
| 2-        | "    | "    | "    | 12.5 | 201.5 |
| 3-        | "    | "    | "    | 12.5 | 214   |
| 4-        | "    | "    | "    | 15   | 227   |
| 5         | "    | "    | "    | 13   | 240   |
| 6         | "    | "    | 9.5  | 12   | 252   |
| 7         | "    | "    | "    | 12   | 264   |
| 8         | "    | "    | "    | 12   | 276   |
| 9         | "    | "    | "    | 12   | 288   |
| 10        | "    | "    | "    | 12   | 300   |
| 11        | "    | "    | "    | 12   | 312   |
| 12        | "    | "    | "    | 12   | 324   |

5 Amps for 3 min  
 then 5 " 1 down then  
 boosted to 15 Amp &  
 back up.

# # 3 Bath

Started Aug 18-20

5 Amps 3 min  
 5 " 1 hr  
 then correct 7-15 min

| PM     | Time | Temp | Volts | Amps | Time |
|--------|------|------|-------|------|------|
| Aug 17 | 1200 | 1225 | 75    | 9    | 15   |
|        | 1050 | "    | "     | "    | 15   |
|        | 200  | "    | "     | "    | 15   |
|        | 300  | "    | "     | "    | 15   |
|        | 400  | "    | "     | "    | 15   |
|        | 500  | "    | "     | "    | 15   |
|        | 600  | "    | "     | "    | 15   |
|        | 700  | "    | "     | "    | 15   |
|        | 800  | "    | "     | "    | 15   |
|        | 9 -  | "    | "     | "    | 15   |
|        | 10   | "    | "     | "    | 15   |
|        | 11   | "    | 78    | "    | 15   |
|        | 12   | "    | "     | "    | 15   |
|        | 100  | 1230 | "     | "    | 15   |
|        | 2    | "    | "     | "    | 15   |
|        | 3    | "    | "     | "    | 15   |
|        | 4    | "    | "     | "    | 15   |
|        | 5    | "    | "     | "    | 15   |
|        | 6    | "    | "     | "    | 15   |
|        | 7    | "    | "     | "    | 15   |
|        | 8    | "    | "     | "    | 15   |
|        | 9    | "    | "     | "    | 15   |
|        | 10   | "    | "     | "    | 15   |
|        | 11   | 1200 | "     | "    | 15   |
|        | 12   | "    | "     | "    | 15   |

#3 Bath

Continued starting 18 @ 10 AM 5 amps

Date Time Sp. L. Temp. Volts Amp. Total sec

4/29

1 AM

2

3

4

5

6

7

8

9

10

11

12

1 PM

2

3

4

5

6

7

8

9

10

11

# 4 Bath

Continued Start Aug. 18, 20. at 101

| TIME | Sp | gr | Temp | Volt | Amph | Notes |
|------|----|----|------|------|------|-------|
| 1.11 |    |    |      |      |      |       |
| 2    |    |    |      |      |      |       |
| 3    |    |    |      |      |      |       |

1.11

2

3

Aug. 20

Telegraph Record  
Master

# #5 Bath Cu

Telegraph Record

Started Aug 19, 20 @ 10:15

Est 477.2

| Time  | Sp & Amp | Volt | Amp | Total |
|-------|----------|------|-----|-------|
| 10:30 | 127.5    | 95   | 7   | 4     |
| 11:30 | 122.5    | 75   | 4   | 8     |
| 12:30 | "        | "    | 4   | 8     |
| 1:30  | "        | "    | 4   | 12    |
| 2:30  | "        | "    | 4   | 16    |
| 3:30  | "        | "    | 4   | 20    |
| 4:30  | "        | "    | 4   | 24    |
| 5:30  | "        | 95   | 9   | 33    |
| 6:30  | "        | "    | 4   | 37    |
| 7:30  | "        | 80   | 14  | 51    |
| 8:30  | "        | "    | 14  | 65    |
| 9:30  | 122.0    | "    | 14  | 79    |
| 10:30 | "        | "    | 14  | 93    |
| 11:30 | "        | "    | 14  | 107   |
| 12:30 | "        | "    | 14  | 121   |
| 1:30  | "        | "    | 14  | 135   |
| 2:30  | "        | "    | 14  | 149   |
| 3:30  | "        | 95   | 14  | 163   |
| 4:30  | "        | "    | 14  | 177   |
| 5:30  | "        | "    | 14  | 191   |
| 6:30  | "        | "    | 14  | 205   |
| 7:30  | "        | "    | 14  | 219   |
| 8:30  | "        | "    | 14  | 233   |
| 9:30  | "        | "    | 14  | 247   |
| 10:30 | "        | "    | 14  | 261   |

#12.16  
Aug 19, 20  
16.25  
Aug 20  
17.25  
18.25  
19.25  
20.25  
21.25  
22.25  
23.25  
24.25  
25.25  
26.25  
27.25  
28.25  
29.25  
30.25

#5 Bath Cu

Started Aug 19-20

34 49 AB

| TIME  | Temp | Watts | Amps | Volts |
|-------|------|-------|------|-------|
| 11:30 | 1775 | 80    | 9.5  | 720   |
| 12:30 | "    | "     | "    | 334   |
| 1:30  | "    | "     | "    | 328   |
| 2:30  | "    | "     | "    | 376   |
| 3:30  | "    | "     | "    | 404   |
| 4:30  | "    | "     | "    | 432   |
| 5:30  | "    | "     | "    | 460   |
| 6:30  | "    | "     | "    | 488   |
| 7:30  | "    | "     | "    | 516   |
| 8:30  | "    | "     | "    | 544   |
| 9:30  | "    | "     | "    | 572   |
| 10:30 | "    | "     | "    | 600   |
| 11:30 | "    | "     | "    | 628   |
| 12:30 | "    | "     | "    | 656   |
| 1:30  | "    | "     | "    | 684   |
| 2:30  | "    | "     | "    | 712   |
| 3:30  | "    | "     | "    | 740   |
| 4:30  | "    | "     | "    | 768   |
| 5:30  | "    | "     | "    | 796   |

Aug 21, 20.

Aug 22

Cont

Cont throw switch  
into meter unless resistance  
on the wood spool is cut out.  
because you only will plate at  
1 Amp.

# #6 Bath

Started Aug. 19. 20

| Time | 8:45 AM | Temp | Wash | Temp | Time | Remarks         |
|------|---------|------|------|------|------|-----------------|
| 2.30 | 1220    | 75   | 7.5  | 4    |      | Inc. 6. 1 form  |
| AM   | Aug     | 2.0  |      |      |      | = 1 Mi. 12th    |
| 1.30 | 1220    | 78   | 9.5  | 15   | 15   | and             |
| 1.00 | "       | "    | "    | 15   | 30   | Started at 1.00 |
|      |         |      |      |      | 6.11 |                 |

# #6 Bath

| Time | 8:45 AM | Temp | Wash | Temp | Time | Remarks         |
|------|---------|------|------|------|------|-----------------|
| 2.00 | 1220    | 75   | 9.5  | 4    |      | Inc. 6. 1 form  |
| 2.04 | "       | "    | "    | 4    | 4    | Bath. Washed    |
| 4.00 | "       | "    | "    | 14   | 28   | then 15. 1 form |
| 5.00 | "       | 78   | "    | 14   | 22   | in 15. 1 form   |
| 6.00 | "       | "    | "    | 14   | 17   | 3 Rows then     |
| 7.00 | "       | "    | "    | 14   | 13   | current time    |
| 7.00 | "       | "    | "    | 14   | 13   | at 1.00         |
| 7.00 | "       | 80   | "    | 14   | 34   |                 |

# #7 Bath

Started Aug 19-20

| Time  | gpgm   | Temp | Volts | Amps | Total | Remarks           |
|-------|--------|------|-------|------|-------|-------------------|
| 12:30 | 1220   | 75   | 9.5   | 4    |       | Transfer from     |
| AM    | Aug 20 |      |       |      |       | #7 Bath           |
| 1:30  | 1220   | 78   | 9.5   | 15   |       | Not Checked       |
| 2:00  | "      | "    | "     | 15   | 30    | Started at 4 Amps |

## #7 Bath

Aug. 20-20

| Time | gpgm | Temp | Volts | Amps | Total | Remarks         |
|------|------|------|-------|------|-------|-----------------|
| 3:00 | 1220 | 75   | 9.5   | 4    |       | #1 Transfer     |
| 3:00 | "    | "    | "     | 4    | 4     | Bath Washed     |
| 4:00 | "    | "    | "     | 14   | 38    | then 15 becomes |
| 5:00 | "    | 79   | "     | 14   | 42    | in Elect Column |
| 6:00 | "    | "    | "     | 14   | 56    | 3 Rev. then     |
| 7:00 | "    | "    | "     | 14   | 70    | current on at   |
| 8:00 | "    | 80   | "     | 14   | 84    | 4 Amps          |



Polish twice over clean  
in water, rinse distill, then clean  
in Electric Cleaner wash & rinse  
distill water  
8-4 Wash then in in Bath to  
40 amps & strips.  
Put in wet, one revolution then  
40 amps for 3 hours, then full current to  
40 amps & strips.  
Then polish again twice  
over and plate again till we  
decide to stop.

Aug 26 20

| TIME | Volts | Amps | Volts | Amps | Total |
|------|-------|------|-------|------|-------|
| 6    | 12.80 | 100  | 9     | 4    |       |
| 7    | "     | "    | 9     | 4    | 7     |
| 8    | "     | "    | 9     | 4    | 8     |
| 9    | "     | "    | 9     | 4    | 12    |
| 11   | "     | "    | 9     | 9    | 21    |
| 12   | 12.75 | 108  | "     | 9    | 30    |
| 1    | 12.80 | "    | "     | 9    | 39    |
| 2    | "     | "    | "     | 9    | 48    |
| 3    | "     | "    | "     | 9    | 57    |
| 4    | "     | "    | "     | 9    | 66    |
| 5    | "     | "    | 8.5   | 74   |       |
| 6    | "     | "    | 8.5   | 83   |       |
| 7    | "     | "    | 8.5   | 91   |       |
| 8    | "     | "    | 8.5   | 100  |       |

#507  
1st stripping

1st stripping

2nd stripping

OK

Out

Aug. 27, 20.

|       | Sp. Wt. | Temp. | Ort. | Amph. | Stel. |
|-------|---------|-------|------|-------|-------|
| 10 AM | 1295    | 98    | 9.   | 4     | 4     |
| 11    | "       | "     | "    | 4     | 4     |
| 12    | "       | "     | "    | 4     | 8     |
| 1 PM  | "       | "     | "    | 4     | 12    |
| 2     | 1280    | 100   | "    | 9     | 21    |
| 3     | "       | "     | "    | 9     | 30    |
| 4     | "       | "     | "    | 9     | 39    |
| 5     | "       | "     | "    | 9     | 48    |

Master 50 #  
2nd stripping

Not finished  
and 26 records  
in 8-4

2nd strip  
OK  
Cent

August 27

|         | Sp. Wt. | Temp. | Ort. | Amph. | Stel. |
|---------|---------|-------|------|-------|-------|
| 9:30    | 1280    | 100   | 9    | 4     | 9     |
| 10:30   | "       | "     | "    | 4     | 4     |
| 11:30   | "       | "     | "    | 4     | 8     |
| 12:30   | "       | "     | "    | 4     | 12    |
| 1:30 PM | "       | "     | "    | 9     | 21    |
| 2:30    | "       | "     | "    | 9     | 30    |
| 3:30    | "       | "     | "    | 9     | 39    |
| 4:30    | "       | "     | "    | 9     | 48    |
| 5:30    | "       | "     | "    | 9     | 57    |
| 6:30    | "       | "     | "    | 9     | 66    |
| 7:30    | "       | "     | "    | 9     | 75    |
| 8:30    | "       | "     | "    | 9     | 84    |

Master  
3rd stripping  
Not finished  
and 20 records  
in 8-4

3rd strip  
OK  
Gut

Master #597

Started Aug 28-20

4<sup>th</sup> Stripping

| TIME     | SPGR | Temp | Voltage | Amps | Notes                       |
|----------|------|------|---------|------|-----------------------------|
| 12:45 AM | 1280 | 98°  | 9       | 4    | Not Polished.               |
| 1 PM     |      |      | 9       | 4    | 4 <sup>th</sup> Stripping   |
| 2 "      |      |      |         | 4    | 5 <sup>th</sup> Min Electro |
| 3 "      |      |      |         | 4    | clean                       |
| 4        |      |      |         | 4    | 20 sec 8-4                  |
| 5        |      |      |         | 9    |                             |
| 6        |      |      |         | 9    | OK                          |
| 7        |      |      |         | 9    | 4 <sup>th</sup> Stripping   |
| 8        |      |      |         | 9    |                             |
| 9        |      |      |         | 9    |                             |
| 10       |      |      |         | 9    |                             |
| 11       |      |      |         | 9    |                             |
| 12       |      |      |         | 9    |                             |
| 1 PM     |      |      |         | 9    |                             |
| 2        |      |      |         | 9    |                             |
| 3        |      |      |         | 9    |                             |
| 4        |      |      |         | 9    |                             |
| 5        |      |      |         | 9    |                             |
| 6        |      |      |         | 9    |                             |
| 7        |      |      |         | 9    |                             |
| 8        |      |      |         | 9    |                             |

Aug 29, 20.

Out

Master #537A

Start Aug 30 20

| Time    | Spide Temp | Volts | Temp | Total | Remarks           |
|---------|------------|-------|------|-------|-------------------|
| 9:30 AM | 1280       | 95    | 9    | 41    |                   |
| 10:30   |            |       | 3.5  | 3     | Not Picked        |
| 11:30   |            |       | 3.5  | 7     | 15 sec. East Lane |
| 12:30   |            |       | 8.5  | 15    | 20" 2-4           |
| 1:30 PM |            |       | 8.5  | 24    |                   |
| 2:30    |            |       | 8.5  | 32    |                   |
| 3:30    |            |       | 8.5  | 41    |                   |
| 4:30    |            |       | 8.5  | 49    |                   |

Start Aug 30 20 @ 10 AM

| Time  | Spide Temp | Volts | Temp | Total | Remarks              |
|-------|------------|-------|------|-------|----------------------|
| 10 AM | 1280       | 95    | 9.5  | 3.5   | # 50 ft. Sp          |
| 11    | "          | "     | "    | 3.5   | 3 Master             |
| 12:30 | "          | "     | "    | 9     | 12 Not picked        |
| 1 PM  | 1270       | 110   | "    | 9     | 21 15 sec. East Lane |
| 2     |            |       | "    | 9     | 30 20" 2-4           |
| 3     |            |       | "    | 9     | 39                   |
| 4     |            |       | "    | 9     | 48 # 7th             |
| 5     |            |       | 9    | 9     | 57 Drapery           |
| 6     |            |       | "    | 9     | 66                   |
| 7     |            |       | "    | 8.5   | 75 Drapery at        |
| 8     |            |       | "    | 8.5   | 83                   |
| 9     |            |       | "    | 8.5   | 92 Cent              |

Master  
 started Aug 31, 20. 9:30 AM. Exp # 50 H  
 Time Exp Temp. Vibe Amp. Steel Remarks  
 9:30 AM 1280 90 9 3.5  
 10:30 3.5 3 Not Polished  
 11:30 9 12 15 sec. Elect. Clean  
 12:30 9 21 20 " 8-4  
 1:30 PM 100 36  
 2:30 9 39  
 3:30 9 46  
 4:30 9 57  
 5:30 9 63  
 6:30 9 72  
 8<sup>th</sup>  
 Stripping  
 15 sec. Elect. Clean  
 Out

Aug 31, 20. 12:30 PM Master # 50 H  
 12 1280 98 9 3.5 Not Polished  
 1 AM Sept 1, 20 3 15 sec. Elect. Clean  
 2 9 21 15 min. 8-4  
 3 9 30  
 4 9 34  
 5 9 48  
 6 9 57  
 7 9 66  
 8 9 75  
 8:30 71  
 9<sup>th</sup>  
 Stripping  
 15 sec. Elect. Clean  
 Out

Started Sept. 1, 20

| Time    | Sp   | Sl | Temp | Volts | amps | Test |
|---------|------|----|------|-------|------|------|
| 9:30 AM | 1280 | 95 | 9.5  | 3.5   |      |      |
| 10:30   |      |    |      | 9     | 3    |      |
| 11:30   |      |    |      | 9     | 12   |      |
| 12:30   |      |    |      | 9     | 21   |      |
| 1:30 PM |      |    |      | 9     | 30   |      |
| 2:30    |      |    |      | 9     | 39   |      |
| 3:30    |      |    |      | 9     | 48   |      |
| 4:30    |      |    |      | 9     | 57   |      |
| 5:30    |      |    |      | 9     | 66   |      |
| 6:30    |      |    |      | 9     | 75   |      |

Meters  
Exp # 50A

Remarks  
not polished  
15 sec. East Clin.  
20 " 8-4

10th  
Shipping

Out

Started Sept. 1, 20

| Time    | Sp   | Sl  | Temp | Volts | amps | Test |
|---------|------|-----|------|-------|------|------|
| 1:14 PM | 1280 | 100 | 9.5  | 3.5   |      |      |
| 2       |      |     |      | 9     | 3    |      |
| 1:14 PM |      |     |      | 9     | 12   |      |
|         |      |     |      | 9     | 21   |      |
|         |      |     |      | 9     | 30   |      |
|         |      |     |      | 9     | 39   |      |
|         |      |     |      | 9     | 48   |      |
|         |      |     |      | 9     | 57   |      |
|         |      |     |      | 9     | 66   |      |
|         |      |     |      | 9     | 75   |      |

Meters  
Exp # 50.7

Remarks  
not polished  
15 sec. East Clin.  
20 " 8-4

11th

Out

send not strip easily. Upper face  
has some of the m. sticking. ~~thru~~  
Scratched at repair department for  
the above defect & fixed over.

[ITEM(S) FOUND IN BOOK]

5<sup>30</sup>  
PM.  
Aug. 26, 20.  
At 1<sup>st</sup> Polish twice over clean in water  
+ then clean Elec. wash then 8/4 -  
Dash then in No Bath 40  
amperes - Drop -  
Then polish again twice over  
+ plate again + 20  
on until we decide to  
stop -

**Notebook Series -- Notebooks by Edison and Other Experimenters**  
**Disc Plating Experiments**  
**Notebook, N-20-07-10**

This notebook was used during July-August 1920 by Edison, Walter N. Archer, Frank Dettlef, Jr., Howard F. Redford, and possibly other experimenters. The entries pertain to the plating processes involved in the manufacture of disc records. At the beginning of the book are tabular reports by Archer of molds plated in various baths with information on the date and time, specific gravity, volts, amps, and other conditions during plating. Also included is a series of numbered experiments by Archer on different methods of handling the molds prior to plating, such as placing them in the bath both wet and dry and with the current both on and off. There are also a few experiments to determine how many molds can be made from one female. Several pages of instructions by Edison have been inserted into the book. The front cover is labeled "July 10, 20-To Aug 19-20-" and "Disc Record" and is marked "Nickel Bath Exper." The pages are unnumbered, and several pages have been removed from the book. Approximately 100 pages have been used.



Michael Bette #1  
 copper face rim 2 minutes before current put on

| July<br>10<br>AM | Lib  | Batts | Comp | Temp | Alt |
|------------------|------|-------|------|------|-----|
| 10:00            | 1280 | 9-5   | 8-5  | 84   |     |
| 11               | 1280 | 9-5   | 9    | 92   | 9   |
| 12<br>PM         | 1280 | 9-5   | 9    | 92   | 18  |
| 1:00             | 1280 | 9-5   | 9    | 93   | 27  |
| 2:00             | 1280 | 9-5   | 9    | 100  | 36  |
| 3:00             | 1280 | 9-5   | 10   | 102  | 46  |
| 4-               | 1280 | 9-5   | 10   | 102  | 56  |
| 5                | 1280 | 9-5   | 10   | 98   | 66  |
| 6                | 1280 | 9-5   | 10   | 98   | 76  |
| 7                | 1280 | 9-5   | 10   | 105  | 86  |

Out

Transferred in 9:15 AM  
 Copper Bette

Nickel Bath No 2  
Nickel fan

| JULY<br>10 | Sh   | Volts | Imp | Imp | Total |
|------------|------|-------|-----|-----|-------|
| AM         | 1280 | 9.5   | 11  | 86  |       |
| 10:00      | 1280 | 9.5   | 12  | 92  | 12    |
| 11         | 1280 | 9.5   | 12  | 92  | 124   |
| 12         | 1280 | 9.5   | 12  | 95  | 36    |
| 1:00 PM    | 1280 | 9.5   | 12  | 97  | 48    |
| 2          | 1280 | 9.5   | 12  | 99  | 60    |
| 3          | 1280 | 9.5   | 13  | 101 | 73    |
| 4          | 1280 | 9.5   | 13  | 100 | 86    |
| 5          | 1280 | 9.5   | 13  | 98  | 99    |
| 6          | 1280 | 9.5   | 13  | 98  | 112   |
| 7          | 1280 | 9.5   | 13  | 105 | 125   |

Out

Transferred in 9:15 7:10  
Copper Bath

When No 1 Mould was put in  
had two dirt on face

# Nickel Bath No 1

run to minutes before current  
out on

| JULY  | Sh   | Volts | Amp | Amp | Test |
|-------|------|-------|-----|-----|------|
| 10 PM |      |       |     |     |      |
| 9:00  | 1265 | 9.5   | 11  | 98  |      |
| 10:00 | 1265 | 9.5   | 11  | 99  | 11   |
| 11:00 | 1265 | 9.5   | 11  | 99  | 22   |
| 12:00 | 1265 | 9.5   | 11  | 99  | 33   |
| 1 AM  | July | 10    |     |     |      |
| 1:00  | 1265 | 9.5   | 11  | 99  | 44   |
| 2:00  | 1265 | 9.5   | 11  | 99  | 55   |
| 3:00  | 1265 | 9.5   | 11  | 99  | 66   |
| 4:00  | 1265 | 9.5   | 10  | 99  | 76   |
| 5:00  | 1270 | 9.5   | 10  | 99  | 86   |
| 6:00  | 1270 | 9.5   | 9.5 | 99  | 95   |
| 7:00  | 1270 | 9.5   | 7.5 | 99  | 105  |
| 8:00  | 1270 | 9.5   | 10  | 100 | 115  |
| 9:00  | 1270 | 9.5   | 10  | 100 | 125  |
| 10:00 | 1270 | 9.5   | 10  | 100 | 135  |
| 11    | 1270 | 9.5   | 10  | 100 | 145  |
| 12    | 1270 | 9.5   | 10  | 100 | 155  |

Out

Transfer to  
# 5 Bath Upper  
Put in dry at  
3.6 Amp. of metal  
one minute, then  
full current vol.

# #2 Nickel Belt

run 2 minutes before current put on

| JULY  | Ln      | Vlto | Ang  | Ang | Total |
|-------|---------|------|------|-----|-------|
| PM    |         |      |      |     |       |
| 9:00  | 1265    | 9-5  | 93   | 95  |       |
| 10:00 | 1265    | 9-5  | 13   | 95  | 13    |
| 11    | 1265    | 9-5  | 13   | 95  | 26    |
| 12    | 1265    | 9-5  | 13   | 95  | 39    |
| AM    | July 10 |      |      |     |       |
| 1:00  | 1265    | 7-5  | 13   | 95  | 52    |
| 2:00  | 1265    | 9-5  | 13   | 96  | 65    |
| 3:00  | 1265    | 9-5  | 13   | 96  | 78    |
| 4:00  | 1265    | 9-5  | 12-5 | 96  | 90    |
| 5:00  | 1270    | 9-5  | 13   | 98  | 103   |
| 6:00  | 1270    | 9-5  | 13   | 97  | 116   |
| 7:00  | 1270    | 9-5  | 13   | 97  | 129   |
| 8:00  | 1270    | 9-5  | 12-5 | 97  | 142   |
| 9:00  | 1270    | 9-5  | 12-5 | 100 | 154   |
| 10:00 | 1270    | 9-5  | 12-5 | 100 | 167   |
| 11:00 | 1270    | 9-5  | 12-5 | 100 | 179   |
| 12:00 | 1270    | 9-5  | 12-5 | 110 | 192   |

14  
13  
135

Out  
Transfer to  
#3 Batch Copper  
Piston wet  
1 min. at 36 Amps  
9th noted then  
full current on

No 2 Michel Muel put in cleaning  
Bath. for 20 seconds put in 8-11 for 2 weeks

## No 2 Michel Bath

| July | Time | Temp | Temp | Temp | Temp |
|------|------|------|------|------|------|
| 5:00 | 1265 | 9-5  | 12   | 90   |      |
| 6:00 | 1265 | 9-5  | 12   | 92   | 12   |
| 7    | 1265 | 9-5  | 12-5 | 93   | 24   |
| 8    | 1290 | 9-5  | 12-5 | 93   | 37   |
| 9    |      |      |      |      |      |
| 10   |      |      |      |      |      |

Out

16/160/10.

Start July 12, 20. at 1 PM  
 Finish " 12 " " 5 PM  
 Total Amps 160  
 " hours 16  
 Average Amps 10.

# Nickel Bath No 1

| To LV | From  | Volts | Amps | Amps | Total |
|-------|-------|-------|------|------|-------|
| 11:12 | 12:00 | 9-5   | 10   | 96   |       |
| 12:00 | 12:00 | 9-5   | 11   | 90   | 11    |
| 12:00 | 12:00 | 9-5   | 11   | 90   | 22    |
| 12:00 | 12:00 | 9-5   | 10-5 | 94   | 32    |
| 12:00 | 12:00 | 9-5   | 10-5 | 96   | 43    |
| 12:00 | 12:00 | 9-5   | 9-5  | 96   | 52    |
| 12:00 | 12:00 | 9-5   | 9-5  | 98   | 62    |
| 12:00 | 12:00 | 9-5   | 9-5  | 100  | 71    |
| 12:00 | 12:00 | 9-5   | 9-5  | 100  | 81    |
| 12:00 | 12:00 | 9-5   | 9-5  | 99   | 90    |
| 12:00 | 12:00 | 9-5   | 9-5  | 99   | 100   |
| 12:00 | 12:00 | 9-5   | 10   | 100  | 110   |
| 12:00 | 12:00 | 9-5   | 10   | 100  | 120   |
| 12:00 | 12:00 | 9-5   | 10   | 105  | 130   |
| 12:00 | 12:00 | 9-5   | 10   | 103  | 140   |
| 12:00 | 12:00 | 9-5   | 10   | 100  | 150   |
| 12:00 | 12:00 | 9-5   | 10   | 100  | 160   |

Out

Transfer to  
 #2 Copper  
 bath.  
 1 min at 2.3  
 amp - 6% acid  
 then full current  
 on.

# 7152 Nickel Bath

| JULY 13 | Shn. | Bath | Amp  | Amp | Total |
|---------|------|------|------|-----|-------|
| 100     | 1265 | 9.5  | 12   | 90  |       |
| 200     | 1265 | 9.5  | 12   | 91  | 12    |
| 300     | 1265 | 9.5  | 12   | 91  | 24    |
| 400     | 1265 | 9.5  | 12   | 93  | 36    |
| 500     | 1270 | 9.5  | 13   | 96  | 49    |
| 600     | 1270 | 9.5  | 13   | 96  | 62    |
| 700     | 1270 | 9.5  | 13   | 96  | 75    |
| 800     | 1270 | 9.5  | 13   | 96  | 88    |
| 900     | 1275 | 9.5  | 13   | 102 | 101   |
| 1000    | 1275 | 9.5  | 13   | 100 | 114   |
| 1100    | 1280 | 9.5  | 13   | 100 | 127   |
| 1200    | 1280 | 9.5  | 13   | 100 | 140   |
| 1300    | 1280 | 9.5  | 13   | 100 | 153   |
| 1400    | 1280 | 9.5  | 13   | 100 | 166   |
| 1500    | 1280 | 9.5  | 12.5 | 103 | 178   |
| 1600    | 1280 | 9.5  | 13   | 98  | 191   |
| 1700    | 1280 | 9.5  | 13   | 104 | 204   |
| 1800    | 1280 | 9.5  | 13   | 104 | 217   |
| 1900    | 1280 | 4.5  | 13   | -   | -     |

Cent  
Transferred to  
#4 Bath. Cu.  
1 minute at  
2.3 Amps  
6<sup>th</sup> notch,  
then full  
current.

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11 12 13 14 15  
16 17 18 19 20  
21 22 23 24 25  
26 27 28 29 30  
31 32 33 34 35  
36 37 38 39 40  
41 42 43 44 45  
46 47 48 49 50  
51 52 53 54 55  
56 57 58 59 60  
61 62 63 64 65  
66 67 68 69 70  
71 72 73 74 75  
76 77 78 79 80  
81 82 83 84 85  
86 87 88 89 90  
91 92 93 94 95  
96 97 98 99 100

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100

Rudolf 22-Minutes Nickel Bath  
put in dry

$$17 \overline{) 171} \quad ( 10.$$

Total Amps. 171.  
hours. 17  
Average Amps. 10.

# ME 1 Nickel Bath

| JULY  | Start | July 12, 20 | at 6:30 PM |      |       |
|-------|-------|-------------|------------|------|-------|
| 12 PM | Start | End         | Time       | Time | Total |
| 6-30  | 1270  | 9.5         | 11         | 99   |       |
| 7-30  | 1270  | 9.5         | 11         | 98   | 11    |
| 8-30  | 1270  | 9.5         | 11         | 98   | 22    |
| 9-30  | 1270  | 9.5         | 10.5       | 98   | 33    |
| 10-30 | 1270  | 9.5         | 11         | 103  | 44    |
| 11-30 | 1270  | 9.5         | 11         | 98   | 55    |
| 12-30 | 1270  | 9.5         | 11         | 98   | 66    |
| 1-30  | 1270  | 9.5         | 11         | 98   | 77    |
| 2-30  | 1270  | 9.5         | 10         | 98   | 87    |
| 3-30  | 1270  | 9.5         | 9.5        | 97   | 97    |
| 4-30  | 1270  | 9.5         | 9.5        | 97   | 106   |
| 5-30  | 1270  | 9.5         | 9.5        | 97   | 116   |
| 6-30  | 1270  | 9.5         | 9.5        | 97   | 125   |
| 7-30  | 1270  | 9.5         | 7          | 70   | 134   |
| 8-30  | 1275  | 9.5         | 9          | 97   | 143   |
| 9-30  | 1275  | 9.5         | 9.5        | 97   | 153   |
| 10-30 | 1275  | 9.5         | 9.5        | 101  | 162   |
| 11-30 | 1275  | 9.5         | 8.5        | 100  | 171   |

Transfer to  
#8 Cu Bath  
July 13, 20  
P.M. ins. wet  
Cu Bath  
Switch to Cu



Pact in dry  
Revolve 2 min. in 13ata  
full current

NS 191 12.3  
360  
310  
500  
465

Start July 12, 20. at 6<sup>30</sup> PM  
Finish " 13, 20 " 10. AM  
Total Amps 191  
" hours 15 1/2  
Average Amps 12.3

# Nickel Bath #2

| JULY  | Started | July  | 12, 20 | at   | 6 <sup>30</sup> PM. |
|-------|---------|-------|--------|------|---------------------|
| 12 PM | Sh      | Volts | Amps   | Temp | Total               |
| 6-30  | 1270    | 9.5   | 12     | 95   |                     |
| 7-30  | 1270    | 9.5   | 12.5   | 97   | 12                  |
| 8-30  | 1270    | 9.5   | 12.5   | 97   | 25                  |
| 9-30  | 1270    | 9.5   | 12.5   | 95   | 37                  |
| 10-30 | 1270    | 9.5   | 13     | 103  | 50                  |
| 11-30 | 1270    | 9.5   | 13.5   | 94   | 64                  |
| 12-30 | 1270    | 9.5   | 13.5   | 94   | 77                  |
| July  |         |       |        |      |                     |
| 1-30  | 1270    | 9.5   | 12.5   | 96   | 90                  |
| 2-30  | 1270    | 9.5   | 12     | 95   | 102                 |
| 3-30  | 1270    | 9.5   | 12     | 95   | 114                 |
| 4-30  | 1270    | 9.5   | 12     | 95   | 126                 |
| 5-30  | 1270    | 9.5   | 12     | 95   | 138                 |
| 6-30  | 1270    | 7.5   | 12     | 95   | 150                 |
| 7-30  | 1270    | 7.5   | 11.5   | 97   | 161                 |
| 8-30  | 1275    | 9.5   | 12     | 96   | 173                 |
| 9-30  | 1275    | 9.5   | 12     | 91   | 185                 |
| 10-   | 1275    | 9.5   | 12     | 91   | 191                 |

12  
191  
51

Out  
Transfer to  
#7 Cu bath  
July 13, 20,

#1 in Bath  
~~Start July 13, 20 12 noon~~  
~~Time Sp. in Bath Sample Temp. Total~~

Revs 27 minutes in Ni bath no current  
then full current on.

8) 95.8 | 11.8  
18  
70

Start July 13, 20 at 2:30 PM.  
Finish " 13, " " 10 PM.  
Total Amps. 95  
" hours. 8  
Average Amps. 11.8

## #2 Ni Bath.

Started July 13 20- 2:30 PM.

| Time    | Sp. Wt. | Volt | Dist | Temp | Total |
|---------|---------|------|------|------|-------|
| 2:30 PM | 1280    | 9.5  | 12.5 | 106  |       |
| 3:30    | 1280    | 9.5  | 12.0 | 99   | 12    |
| 4:30    | 1280    | 9.5  | 12.1 | 99   | 24    |
| 5:30    | 1280    | 9.5  | 12   | 101  | 36    |
| 6:30    | 1280    | 9.5  | 12   | 100  | 48    |
| 7:30    | 1280    | 9.5  | 12   | 100  | 60    |
| 8:30    | 1280    | 9.5  | 11.5 | 99   | 72    |
| 9:30    | 1280    | 9.5  | 11.5 | 98   | 83    |
| 10 PM   | 1280    | 9.5  | 12   | 98   | 95    |

added acetic acid

Cent.

Using pumice  
after ammonia water  
wash & rinse distill  
and dried.

Transfer to #  
3 Copper bath

Nickel No 1 Bath

Started July 13. at 12 PM

| PM    | SEGR. | VOLTS | AMP. | TEMP | TOTAL |
|-------|-------|-------|------|------|-------|
| 12.00 | 12.60 | 9.5   | 10   | 95   |       |
| 1.00  | 12.60 | 9.5   | 10.5 | 95   | 10    |
| 2.00  | 12.60 | 9.5   | 11   | 94   | 21    |
| 3.00  | 12.60 | 9.5   | 11   | 94   | 32    |
| 4.00  | 12.60 | 9.5   | 11   | 96   | 43    |
| 5.00  | 12.60 | 9.5   | 11   | 96   | 54    |
| 6.00  | 12.60 | 9.5   | 11   | 97   | 65    |
| 7.00  | 12.60 | 9.5   | 11   | 97   | 76    |
| 8.00  | 12.60 | 9.5   | 11   | 96   | 87    |
| 9.00  | 12.60 | 9.5   | 11   | 96   | 98    |
| 10.00 | 12.60 | 9.5   | 11   | 96   | 109   |
| 11.00 | 12.60 | 9.5   | 11   | 96   | 120   |
| 12.00 | 12.60 | 9.5   | 11   | 96   | 131   |
| 1.00  | 12.60 | 9.5   | 11   | 96   | 142   |
| 2.00  | 12.60 | 9.5   | 11   | 96   | 153   |
| 3.00  | 12.60 | 9.5   | 11   | 96   | 164   |
| 4.00  | 12.60 | 9.5   | 11   | 96   | 175   |
| 5.00  | 12.60 | 9.5   | 11   | 96   | 186   |
| 6.00  | 12.60 | 9.5   | 11   | 96   | 197   |
| 7.00  | 12.60 | 9.5   | 11   | 96   | 208   |
| 8.00  | 12.60 | 9.5   | 11   | 96   | 219   |
| 9.00  | 12.60 | 9.5   | 11   | 96   | 230   |
| 10.00 | 12.60 | 9.5   | 11   | 96   | 241   |
| 11.00 | 12.60 | 9.5   | 11   | 96   | 252   |
| 12.00 | 12.60 | 9.5   | 11   | 96   | 263   |
| 1.00  | 12.60 | 9.5   | 11   | 96   | 274   |
| 2.00  | 12.60 | 9.5   | 11   | 96   | 285   |
| 3.00  | 12.60 | 9.5   | 11   | 96   | 296   |
| 4.00  | 12.60 | 9.5   | 11   | 96   | 307   |
| 5.00  | 12.60 | 9.5   | 11   | 96   | 318   |
| 6.00  | 12.60 | 9.5   | 11   | 96   | 329   |
| 7.00  | 12.60 | 9.5   | 11   | 96   | 340   |
| 8.00  | 12.60 | 9.5   | 11   | 96   | 351   |
| 9.00  | 12.60 | 9.5   | 11   | 96   | 362   |
| 10.00 | 12.60 | 9.5   | 11   | 96   | 373   |
| 11.00 | 12.60 | 9.5   | 11   | 96   | 384   |
| 12.00 | 12.60 | 9.5   | 11   | 96   | 395   |
| 1.00  | 12.60 | 9.5   | 11   | 96   | 406   |
| 2.00  | 12.60 | 9.5   | 11   | 96   | 417   |
| 3.00  | 12.60 | 9.5   | 11   | 96   | 428   |
| 4.00  | 12.60 | 9.5   | 11   | 96   | 439   |
| 5.00  | 12.60 | 9.5   | 11   | 96   | 450   |
| 6.00  | 12.60 | 9.5   | 11   | 96   | 461   |
| 7.00  | 12.60 | 9.5   | 11   | 96   | 472   |
| 8.00  | 12.60 | 9.5   | 11   | 96   | 483   |
| 9.00  | 12.60 | 9.5   | 11   | 96   | 494   |
| 10.00 | 12.60 | 9.5   | 11   | 96   | 505   |
| 11.00 | 12.60 | 9.5   | 11   | 96   | 516   |
| 12.00 | 12.60 | 9.5   | 11   | 96   | 527   |
| 1.00  | 12.60 | 9.5   | 11   | 96   | 538   |
| 2.00  | 12.60 | 9.5   | 11   | 96   | 549   |
| 3.00  | 12.60 | 9.5   | 11   | 96   | 560   |
| 4.00  | 12.60 | 9.5   | 11   | 96   | 571   |
| 5.00  | 12.60 | 9.5   | 11   | 96   | 582   |
| 6.00  | 12.60 | 9.5   | 11   | 96   | 593   |
| 7.00  | 12.60 | 9.5   | 11   | 96   | 604   |
| 8.00  | 12.60 | 9.5   | 11   | 96   | 615   |
| 9.00  | 12.60 | 9.5   | 11   | 96   | 626   |
| 10.00 | 12.60 | 9.5   | 11   | 96   | 637   |
| 11.00 | 12.60 | 9.5   | 11   | 96   | 648   |
| 12.00 | 12.60 | 9.5   | 11   | 96   | 659   |
| 1.00  | 12.60 | 9.5   | 11   | 96   | 670   |
| 2.00  | 12.60 | 9.5   | 11   | 96   | 681   |
| 3.00  | 12.60 | 9.5   | 11   | 96   | 692   |
| 4.00  | 12.60 | 9.5   | 11   | 96   | 703   |
| 5.00  | 12.60 | 9.5   | 11   | 96   | 714   |
| 6.00  | 12.60 | 9.5   | 11   | 96   | 725   |
| 7.00  | 12.60 | 9.5   | 11   | 96   | 736   |
| 8.00  | 12.60 | 9.5   | 11   | 96   | 747   |
| 9.00  | 12.60 | 9.5   | 11   | 96   | 758   |
| 10.00 | 12.60 | 9.5   | 11   | 96   | 769   |
| 11.00 | 12.60 | 9.5   | 11   | 96   | 780   |
| 12.00 | 12.60 | 9.5   | 11   | 96   | 791   |
| 1.00  | 12.60 | 9.5   | 11   | 96   | 802   |
| 2.00  | 12.60 | 9.5   | 11   | 96   | 813   |
| 3.00  | 12.60 | 9.5   | 11   | 96   | 824   |
| 4.00  | 12.60 | 9.5   | 11   | 96   | 835   |
| 5.00  | 12.60 | 9.5   | 11   | 96   | 846   |
| 6.00  | 12.60 | 9.5   | 11   | 96   | 857   |
| 7.00  | 12.60 | 9.5   | 11   | 96   | 868   |
| 8.00  | 12.60 | 9.5   | 11   | 96   | 879   |
| 9.00  | 12.60 | 9.5   | 11   | 96   | 890   |
| 10.00 | 12.60 | 9.5   | 11   | 96   | 901   |
| 11.00 | 12.60 | 9.5   | 11   | 96   | 912   |
| 12.00 | 12.60 | 9.5   | 11   | 96   | 923   |
| 1.00  | 12.60 | 9.5   | 11   | 96   | 934   |
| 2.00  | 12.60 | 9.5   | 11   | 96   | 945   |
| 3.00  | 12.60 | 9.5   | 11   | 96   | 956   |
| 4.00  | 12.60 | 9.5   | 11   | 96   | 967   |
| 5.00  | 12.60 | 9.5   | 11   | 96   | 978   |
| 6.00  | 12.60 | 9.5   | 11   | 96   | 989   |
| 7.00  | 12.60 | 9.5   | 11   | 96   | 1000  |
| 8.00  | 12.60 | 9.5   | 11   | 96   | 1011  |
| 9.00  | 12.60 | 9.5   | 11   | 96   | 1022  |
| 10.00 | 12.60 | 9.5   | 11   | 96   | 1033  |
| 11.00 | 12.60 | 9.5   | 11   | 96   | 1044  |
| 12.00 | 12.60 | 9.5   | 11   | 96   | 1055  |
| 1.00  | 12.60 | 9.5   | 11   | 96   | 1066  |
| 2.00  | 12.60 | 9.5   | 11   | 96   | 1077  |
| 3.00  | 12.60 | 9.5   | 11   | 96   | 1088  |
| 4.00  | 12.60 | 9.5   | 11   | 96   | 1099  |
| 5.00  | 12.60 | 9.5   | 11   | 96   | 1110  |
| 6.00  | 12.60 | 9.5   | 11   | 96   | 1121  |
| 7.00  | 12.60 | 9.5   | 11   | 96   | 1132  |
| 8.00  | 12.60 | 9.5   | 11   | 96   | 1143  |
| 9.00  | 12.60 | 9.5   | 11   | 96   | 1154  |
| 10.00 | 12.60 | 9.5   | 11   | 96   | 1165  |
| 11.00 | 12.60 | 9.5   | 11   | 96   | 1176  |
| 12.00 | 12.60 | 9.5   | 11   | 96   | 1187  |
| 1.00  | 12.60 | 9.5   | 11   | 96   | 1198  |
| 2.00  | 12.60 | 9.5   | 11   | 96   | 1209  |
| 3.00  | 12.60 | 9.5   | 11   | 96   | 1220  |
| 4.00  | 12.60 | 9.5   | 11   | 96   | 1231  |
| 5.00  | 12.60 | 9.5   | 11   | 96   | 1242  |
| 6.00  | 12.60 | 9.5   | 11   | 96   | 1253  |
| 7.00  | 12.60 | 9.5   | 11   | 96   | 1264  |
| 8.00  | 12.60 | 9.5   | 11   | 96   | 1275  |
| 9.00  | 12.60 | 9.5   | 11   | 96   | 1286  |
| 10.00 | 12.60 | 9.5   | 11   | 96   | 1297  |
| 11.00 | 12.60 | 9.5   | 11   | 96   | 1308  |
| 12.00 | 12.60 | 9.5   | 11   | 96   | 1319  |
| 1.00  | 12.60 | 9.5   | 11   | 96   | 1330  |
| 2.00  | 12.60 | 9.5   | 11   | 96   | 1341  |
| 3.00  | 12.60 | 9.5   | 11   | 96   | 1352  |
| 4.00  | 12.60 | 9.5   | 11   | 96   | 1363  |
| 5.00  | 12.60 | 9.5   | 11   | 96   | 1374  |
| 6.00  | 12.60 | 9.5   | 11   | 96   | 1385  |
| 7.00  | 12.60 | 9.5   | 11   | 96   | 1396  |
| 8.00  | 12.60 | 9.5   | 11   | 96   | 1407  |
| 9.00  | 12.60 | 9.5   | 11   | 96   | 1418  |
| 10.00 | 12.60 | 9.5   | 11   | 96   | 1429  |
| 11.00 | 12.60 | 9.5   | 11   | 96   | 1440  |
| 12.00 | 12.60 | 9.5   | 11   | 96   | 1451  |
| 1.00  | 12.60 | 9.5   | 11   | 96   | 1462  |
| 2.00  | 12.60 | 9.5   | 11   | 96   | 1473  |
| 3.00  | 12.60 | 9.5   | 11   | 96   | 1484  |
| 4.00  | 12.60 | 9.5   | 11   | 96   | 1495  |
| 5.00  | 12.60 | 9.5   | 11   | 96   | 1506  |
| 6.00  | 12.60 | 9.5   | 11   | 96   | 1517  |
| 7.00  | 12.60 | 9.5   | 11   | 96   | 1528  |
| 8.00  | 12.60 | 9.5   | 11   | 96   | 1539  |
| 9.00  | 12.60 | 9.5   | 11   | 96   | 1550  |
| 10.00 | 12.60 | 9.5   | 11   | 96   | 1561  |
| 11.00 | 12.60 | 9.5   | 11   | 96   | 1572  |
| 12.00 | 12.60 | 9.5   | 11   | 96   | 1583  |
| 1.00  | 12.60 | 9.5   | 11   | 96   | 1594  |
| 2.00  | 12.60 | 9.5   | 11   | 96   | 1605  |
| 3.00  | 12.60 | 9.5   | 11   | 96   | 1616  |
| 4.00  | 12.60 | 9.5   | 11   | 96   | 1627  |
| 5.00  | 12.60 | 9.5   | 11   | 96   | 1638  |
| 6.00  | 12.60 | 9.5   | 11   | 96   | 1649  |
| 7.00  | 12.60 | 9.5   | 11   | 96   | 1660  |
| 8.00  | 12.60 | 9.5   | 11   | 96   | 1671  |
| 9.00  | 12.60 | 9.5   | 11   | 96   | 1682  |
| 10.00 | 12.60 | 9.5   | 11   | 96   | 1693  |
| 11.00 | 12.60 | 9.5   | 11   | 96   | 1704  |
| 12.00 | 12.60 | 9.5   | 11   | 96   | 1715  |
| 1.00  | 12.60 | 9.5   | 11   | 96   | 1726  |
| 2.00  | 12.60 | 9.5   | 11   | 96   | 1737  |
| 3.00  | 12.60 | 9.5   | 11   | 96   | 1748  |
| 4.00  | 12.60 | 9.5   | 11   | 96   | 1759  |
| 5.00  | 12.60 | 9.5   | 11   | 96   | 1770  |
| 6.00  | 12.60 | 9.5   | 11   | 96   | 1781  |
| 7.00  | 12.60 | 9.5   | 11   | 96   | 1792  |
| 8.00  | 12.60 | 9.5   | 11   | 96   | 1803  |
| 9.00  | 12.60 | 9.5   | 11   | 96   | 1814  |
| 10.00 | 12.60 | 9.5   | 11   | 96   | 1825  |
| 11.00 | 12.60 | 9.5   | 11   | 96   | 1836  |
| 12.00 | 12.60 | 9.5   | 11   | 96   | 1847  |
| 1.00  | 12.60 | 9.5   | 11   | 96   | 1858  |
| 2.00  | 12.60 | 9.5   | 11   | 96   | 1869  |
| 3.00  | 12.60 | 9.5   | 11   | 96   | 1880  |
| 4.00  | 12.60 | 9.5   | 11   | 96   | 1891  |
| 5.00  | 12.60 | 9.5   | 11   | 96   | 1902  |
| 6.00  | 12.60 | 9.5   | 11   | 96   | 1913  |
| 7.00  | 12.60 | 9.5   | 11   | 96   | 1924  |
| 8.00  | 12.60 | 9.5   | 11   | 96   | 1935  |
| 9.00  | 12.60 | 9.5   | 11   | 96   | 1946  |
| 10.00 | 12.60 | 9.5   | 11   | 96   | 1957  |
| 11.00 | 12.60 | 9.5   | 11   | 96   | 1968  |
| 12.00 | 12.60 | 9.5   | 11   | 96   | 1979  |
| 1.00  | 12.60 | 9.5   | 11   | 96   | 1990  |
| 2.00  | 12.60 | 9.5   | 11   | 96   | 2001  |
| 3.00  | 12.60 | 9.5   | 11   | 96   | 2012  |
| 4.00  | 12.60 | 9.5   | 11   | 96   | 2023  |
| 5.00  | 12.60 | 9.5   | 11   | 96   | 2034  |
| 6.00  | 12.60 | 9.5   | 11   | 96   | 2045  |
| 7.00  | 12.60 | 9.5   | 11   | 96   | 2056  |
| 8.00  | 12.60 | 9.5   | 11   | 96   | 2067  |
| 9.00  | 12.60 | 9.5   | 11   | 96   | 2078  |
| 10.00 | 12.60 | 9.5   | 11   | 96   | 2089  |
| 11.00 | 12.60 | 9.5   | 11   | 96   | 2100  |
| 12.00 | 12.60 | 9.5   | 11   | 96   | 2111  |
| 1.00  | 12.60 | 9.5   | 11   | 96   | 2122  |
| 2.00  | 12.60 | 9.5   | 11   | 96   | 2133  |
| 3.00  | 12.60 | 9.5   | 11   | 96   | 2144  |
| 4.00  | 12.60 | 9.5   | 11   | 96   | 2155  |
| 5.00  | 12.60 | 9.5   | 11   | 96   | 2166  |
| 6.00  | 12.60 | 9.5   | 11   | 96   | 2177  |
| 7.00  | 12.60 | 9.5   | 11   | 96   | 2188  |
| 8.00  | 12.60 | 9.5   | 11   | 96   | 2199  |
| 9.00  | 12.60 | 9.5   | 11   | 96   | 2210  |
| 10.00 | 12.60 | 9.5   | 11   | 96   | 2221  |
| 11.00 | 12.60 | 9.5   | 11   | 96   | 2232  |
| 12.00 | 12.60 | 9.5   | 11   | 96   | 2243  |
| 1.00  | 12.60 | 9.5   | 11   | 96   | 2254  |
| 2.00  | 12.60 | 9.5   | 11   | 96   | 2265  |
| 3.00  | 12.60 | 9.5   | 11   | 96   | 2276  |
| 4.00  | 12.60 | 9.5   | 11   | 96   | 2287  |
| 5.00  | 12.60 | 9.5   | 11   | 96   | 2298  |
| 6.00  | 12.60 | 9.5   | 11   | 96   | 2309  |
| 7.00  | 12.60 | 9.5   | 11   | 96   | 2320  |
| 8.00  | 12.60 | 9.5   | 11   | 96   | 2331  |
| 9.00  | 12.60 | 9.5   | 11   | 96   | 2342  |
| 10.00 | 12.60 | 9.5   | 11   | 96   | 2353  |
| 11.00 | 12.60 | 9.5   | 11   | 96   | 2364  |
| 12.00 | 12.60 | 9.5   | 11   | 96   | 2375  |
| 1.00  | 12.60 | 9.5   | 11   | 96   | 2386  |
| 2.00  | 12.60 | 9.5   | 11   | 96   | 2397  |
|       |       |       |      |      |       |

Revolves 2 min in Ni bath no current

12 | 143 | 12.  
 $\frac{123}{12}$

Total Amps 143  
 " hours 12  
 Average Amps 12

Nickel No 2 Bath  
 Started July 13 at 12 PM

| PM    | SP. GR. | VOLTS | AMP. | TEMP. | TOTAL |
|-------|---------|-------|------|-------|-------|
| 12.00 | 12.60   | 9.5   | 12   | 94    |       |
| 1.00  | 12.60   | 9.5   | 12   | 94    | 12    |
| 2.00  | 12.60   | 9.5   | 12   | 96    | 24    |
| 3.00  | 12.60   | 9.5   | 12   | 95    | 36    |
| 4.00  | 12.60   | 9.5   | 12   | 95    | 48    |
| 5.00  | 12.60   | 9.5   | 12   | 95    | 60    |
| 6.00  | 12.60   | 9.5   | 12   | 95    | 72    |
| 7.00  | 12.60   | 9.5   | 12   | 95    | 84    |
| 8.00  | 12.60   | 9.5   | 11.5 | 95    | 95    |
| 9 -   | 12.65   | 9.5   | 11.5 | 95    | 107   |
| 10 -  | 12.70   | 9.5   | 12   | 95    | 119   |
| 11 -  | 12.70   | 9.5   | 12   | 97    | 131   |
| 12    | 12.70   | 9.5   | 12   | 97    | 143   |

Transferred  
 #5 Copper bath  
 Put in dry

20 seconds in Electric Cleaner.  
8-4

Put in dry  
2 minutes revolved, then current

#1-Nickel Bath

Started July 14, 20 at 1 P.M.

| Time S. G.  | Voltage | Amperes | Temp        | Total |
|-------------|---------|---------|-------------|-------|
| 1 P.M. 1270 | 9.5     | 9.5     | 99          |       |
| 2-1265      | 9.5     | 10      | 104         | 10    |
| 3-1265      | 9.5     | 10      | 104         | 20    |
| 4-1265      | 9.5     | 10      | 105         | 30    |
| 5-1265      | 9.5     | 10      | 106         | 40    |
|             |         |         | <u>Just</u> |       |

added acid  
Acetic

Transfer to #4  
Copper Bath.

4)  $\frac{51}{30}$  (12.7)

Total amps = 48 51  
 hours = 4  
 Average Amps = 12.7

#2 Nickel Bath.  
 Started July 14, 20 6 P.M.

| Time   | S.G.  | Volts | Amps | Temp. | Total |
|--------|-------|-------|------|-------|-------|
| 1 P.M. | 1.270 | 9.5   | 12   | 102   |       |
| 2-     | 1.265 | 9.5   | 12.5 | 102   | 12    |
| 3-     | 1.265 | 9.5   | 12.5 | 102   | 25    |
| 4-     | 1.265 | 9.5   | 13   | 103   | 38    |
| 5-     | 1.265 | 9.5   | 13   | 104   | 51    |

Added acid  
 acetic.

Transfer to #2  
 Pot-pen bath.

When #2 Ni, dissolves, out put more  
 nickel in anode  
 chamber.

OK

marked 45  
 connected to 51

Ni face disc  
 Put in Ni bath full current day  
 When put in copper bath  
 put in dry, full current on.  
 Total Amps 97 Ni bath.

10/97 | 9.7

Total Amps = 97  
 " hours = 10  
 Average Amps = 9.7

#1 Ni Bath  
 Started July 14, 20. @ 12 PM.

| Time  | Sp. g. | Water | Amps | Temp | Total |
|-------|--------|-------|------|------|-------|
| 12.00 | 12.9   | 9.5   | 10   | 95   |       |
| 1M    | July   | 15    |      |      |       |
| 1.00  | 12.9   | 9.5   | 10   | 95   | 10    |
| 2.00  | 12.9   | 9.5   | 10   | 95   | 20    |
| 3.00  | 12.9   | 9.5   | 10   | 95   | 30    |
| 4.00  | 12.9   | 9.5   | 10   | 95   | 40    |
| 5.00  | 12.9   | 9.5   | 10   | 95   | 50    |
| 6.00  | 12.9   | 9.5   | 10   | 95   | 60    |
| 7.00  | 12.9   | 9.5   | 10   | 95   | 70    |
| 8.00  | 12.9   | 9.5   | 10   | 95   | 80    |
| 9.00  | 12.9   | 9.5   | 10   | 95   | 90    |
| 10.00 | 12.9   | 9.5   | 10   | 95   | 100   |

Sawed blistrop  
 disc  
 Out  
~~Transfer to~~  
~~upper bath, with~~  
~~full current day~~

Showed blister at 8<sup>00</sup> July 15, 20.  
 Mr. Edison stripped this disc.



in face disc.

Put in in bath full current wet

When put in copper bath put  
in dry full current on

Total Amps 125 in bath,

10 | 12.8 | 12.8

Total Amps 128  
" hours 10  
Average Amps 12.8

#2 in Bath

Started July 18, 20 - @ 12 P.M.

| PM    | SRC  | VOLTS | AMP | TEMP | TOTAL |
|-------|------|-------|-----|------|-------|
| 12:00 | 1270 | 9.5   | 12  | 92   |       |
| AM    | 1270 | 9.5   | 12  | 94   | 12    |
| 1:00  | 1270 | 9.5   | 12  | 94   | 12    |
| 2:00  | 1270 | 9.5   | 12  | 94   | 12    |
| 3:00  | 1270 | 9.5   | 12  | 94   | 12    |
| 4:00  | 1270 | 9.5   | 12  | 94   | 12    |
| 5:00  | 1270 | 9.5   | 12  | 94   | 12    |
| 6:00  | 1270 | 9.5   | 12  | 94   | 12    |
| 7:00  | 1270 | 9.5   | 12  | 94   | 12    |
| 8:00  | 1270 | 9.5   | 12  | 94   | 12    |
| 9-    | 1280 | 9.5   | 13  | 96   | 115   |
| 10    | 1280 | 9.5   | 13  | 96   | 128   |

~~Expt~~  
~~Amperes~~  
~~Stop with~~  
~~full current~~  
Mr Edison Stopped this day

Ni face disc,  
Electric cleaner. 30 seconds.

8-4. one minute

Put in Ni Bath dry  
Full current on.

#1 shows blisters after 20 minutes

# #1 Ni Bath

Started July 15, 20. 11<sup>30</sup> AM.

| Time                | Sp. Dr. | Voltage | Temp | Time | Total |
|---------------------|---------|---------|------|------|-------|
| 11 <sup>30</sup> AM | 1280    | 9.5     | 10   | 88   |       |
| 12 <sup>30</sup>    | 1280    | 9.5     | 10   | 89   | 10    |
| 1 <sup>30</sup> PM  | 1280    | 9.5     | 10   | 90   | 20    |
| 2 <sup>30</sup>     | 1280    | 9.5     | 10   |      | 30    |

Out

Elect. Clean 30 sec.  
8-4 60 "  
very in Bath full  
current on.

Taken out to try stripping  
from blisters

in face disc.

Electric Cleaner 30 seconds.

S-4 One minute

Put in in Bath wet  
full current on

#2 in Bath

Started July 15 20

11:30 AM.

| Time  | Sp. In | Volt | Temp | Watts | Total |
|-------|--------|------|------|-------|-------|
| 11:30 | 1280   | 9.5  | 12   | 84    | 12    |
| 12:30 | 1280   | 9.5  | 12   | 89    | 24    |
| 1:30  | 1280   | 9.5  | 12   | 90    | 36    |
| 2:30  | 1280   | 9.5  | 12   | 90    | 36    |

Out

Taken out to  
try stopping  
from blisters

Hi face wise.  
Treated Electric  $\frac{1}{2}$  min. Clean  
" P-4 1 min

Wash in whirler, then rinse in  
distilled water, and dry in  
whirler.

Put in Ni bath dry  
Reverse 1 min no current.  
Then full current, on.

Washed and rinsed well before  
drying to put in Ni bath

7/70/10

Total Amps 70  
" hours 7  
Average amp 10

# #1 Ni Bath

Start July 15, 20- PM.

| Time | Sp. in | Volts | Amps | Temp | Total |
|------|--------|-------|------|------|-------|
| 3 PM | 1250   | 9.5   | 10   | 90   |       |
| 4 -  | 1250   | 9.5   | 11   | 90   | 1.1   |
| 5 -  | 1280   | 9.5   | 10   | 93   | 2.1   |
| 6 -  | 1280   | 9.5   | 10   | 100  | 3.1   |
| 7 -  | 1280   | 9.5   | 10   | 100  | 4.1   |
| 8 -  | 1280   | 9.5   | 10   | 105  | 5.1   |
| 9 -  | 1250   | 9.5   | 9.5  | 103  | 6.0   |
| 10 - | 1280   | 9.5   | 9.5  | 103  | 7.0   |

Transfer to  
#2 Copper  
Bath July 15

hi face disc.  
treated Electric Cleaner 1/2 hr.  
" 8-4 1 minute

Rash in whorls, rinse in  
distilled water.  
Put in wet hi bath.  
Revolve 1 minute no current,  
Then full current on.

Washed and rinsed well, before  
putting into hi bath.

7/84/12-

Total Amps 84  
hours 7.  
Average Amps 12.-

#2 hi Bath

Started July 15, 20 - P.M.

| Time   | Sp   | Volts | Amps | Temp | Total |
|--------|------|-------|------|------|-------|
| 3 P.M. | 1250 | 9.5   | 13.  | 90   |       |
| 4-     | 1280 | 9.5   | 12   | 90   | 12    |
| 5-     | 1280 | 9.5   | 12   | 94   | 24    |
| 6-     | 1290 | 9.5   | 12   | 96   | 36    |
| 7-     | 1280 | 9.5   | 12   | 98   | 48    |
| 8-     | 1280 | 9.5   | 12   | 99   | 60    |
| 9-     | 1280 | 9.5   | 12   | 100  | 72    |
| 10     | 1280 | 9.5   | 12   | 112  | 84    |

Out

~~7.5~~

Transferred to  
#8 Apparatus  
July 15, 20.

✓

115) 116 (10.

|              |        |
|--------------|--------|
| Total camps  | 116    |
| " hours      | 11 1/2 |
| Average camp | 10.    |

Started July 15, 20 - at 10.55 pm.

| <u>Date</u> | <u>To</u> | <u>Villa</u> | <u>Anch</u> | <u>Samp</u> | <u>Total</u> |       |
|-------------|-----------|--------------|-------------|-------------|--------------|-------|
| 6/7/59      | 1280      | 9.5          | 10.5        | 98          |              | Known |
| 11/35       | 1280      | 9.5          | 10.5        | 98          | 10           |       |
| 12/35       | 1280      | 9.5          | 10.5        | 98          | 21           |       |
| 1/3/60      |           | Jan 16,      | 20          |             |              |       |
| 1/3/60      | 1280      | 9.5          | 10.5        | 98          | 37           |       |
| 2/35        | 1280      | 9.5          | 10.5        | 97          | 42           |       |
| 3/35        | 1280      | 9.5          | 10          | 100         | 52           |       |
| 4/35        | 1280      | 9.5          | 9.5         | 100         | 58           |       |
| 5/35        | 1280      | 9.5          | 9.5         | 100         | 60           |       |
| 6/36        | 1280      | 9.5          | 9.5         | 100         | 67           |       |
| 7/35        | 1280      | 9.5          | 8.5         | 95          | 74           |       |
| 8/35        | 1270      | 9.5          | 10.         | 92          | 107          |       |
| 9/40        | 1270      | 9.5          | 9           | 92          | 116          | CC    |

Transfer to  
#2 Copper  
Bath  
July 16, 20.  
Put in dry Cu  
full current and

$$11.5 \overline{) 137.25} \quad (11.9$$

$$\begin{array}{r} 220 \\ 110 \\ \hline 110 \end{array}$$

Total Amps 137  
 " hours 11 1/2  
 Average Amps 11.9

#2 Hi Bath  
Started July 15, 20- at 1038 P.M.

| Time  | Sp   | Volt | Amps | Temp | Total |
|-------|------|------|------|------|-------|
| 10:58 | 1280 | 91.5 | 11   | 9.8  | 1/2   |
| 11:28 | 1280 | 91.5 | 14.5 | 10.2 |       |
| 12:28 | 1280 | 91.5 | 14.5 | 10.2 |       |
| 1:14  | 1280 | 91.5 | 16   | 10.2 |       |
| 1:28  | 1280 | 91.5 | 11.5 | 9.8  | 1/2   |
| 2:28  | 1280 | 91.5 | 14.5 | 10.2 | 1/2   |
| 3:28  | 1280 | 91.5 | 14.5 | 10.2 | 1/2   |
| 4:28  | 1280 | 91.5 | 14.5 | 10.2 | 1/2   |
| 5:28  | 1280 | 91.5 | 14.5 | 10.2 | 1/2   |
| 6:20  | 1280 | 91.5 | 11.5 | 9.8  | 1/2   |
| 7:20  | 1280 | 91.5 | 11.5 | 9.8  | 1/2   |
| 8:20  | 1280 | 91.5 | 11.5 | 9.8  | 1/2   |
| 9:20  | 1280 | 91.5 | 12   | 9.2  | 12.5  |
| 10:20 | 1280 | 91.5 | 12   | 9.2  | 13.7  |
| 10:40 |      | 95   |      |      |       |

Out  
~~17.1.19.1~~  
Transfer to #  
3 Copper bath  
July 16, 20.  
Part in dry Cu  
full current on



2-fri faced females  
Considerably rounded edges  
Electro Chlor 30 sec

8-4 - one minute

Put in Mi Bath dry

Revolve 2 minutes, then put current on

Run to 7.5 Amper

105 | 105 | 10

Total Amps 105  
in hours 10 1/2  
Average Amps 10.

# #1 Mi Bath

Started July 16, 20, @ 12 AM.

| Time     | Sp. Amp | V. Pot | Amp | Temp | Total |
|----------|---------|--------|-----|------|-------|
| 12:20 AM | 1270    | 9.5    | 9.5 | 95   |       |
| 1:30     | 1270    | 9.5    | 10. | 93   | 10    |
| 2:30     | 1270    | 9.5    | 10. | 93   | 20    |
| 3:30     | 1270    | 9.5    | 10. | 97   | 30    |
| 4:30     | 1270    | 9.5    | 10  | 97   | 40    |
| 5:30     | 1270    | 9.5    | 10  | 95   | 50    |
| 6:30     | 1275    | 9.5    | 10  | 96   | 60    |
| 7:30     | 1275    | 9.5    | 10  | 96   | 70    |
| 8:30     | 1275    | 9.5    | 10  | 98   | 80    |
| 9:30     | 1275    | 9.5    | 10  | 99   | 90    |
| 10:30    | 1275    | 9.5    | 10  | 99   | 100   |
| 11-      | 1275    | 9.5    | 10  | 99   | 105   |

showed blisters.  
at 1:30, 2 Rings

Note if any  
knobs appear  
on trees.

Out  
Transfer to  
#6 Rsp. for bath  
July 16, 20.



Same as #1 Ni Bath  
of July 14, 200 @ 12:30 AM

105 | 124 | 11.8  
 105 | 124 | 11.8  
 105 | 124 | 11.8  
 105 | 124 | 11.8

Total Amps 124  
 11 hours 10 1/2  
 Average Amps 11.8

## #2 Ni Bath

| Time     | Temp  | Volt | Amps | Temp | Total |          |
|----------|-------|------|------|------|-------|----------|
| 12:30 AM | 127.0 | 9.5  | 12.5 | 9.5  |       | 12:30 AM |
| 1:30     | 127.0 | 9.5  | 12   | 9.5  | 12    |          |
| 2:30     | 127.0 | 9.5  | 12   | 9.5  | 24    |          |
| 3:30     | 127.0 | 9.5  | 11   | 9.5  | 35    |          |
| 4:30     | 127.0 | 9.5  | 12   | 9.5  | 47    |          |
| 5:30     | 127.0 | 9.5  | 11.5 | 9.5  | 58    |          |
| 6:30     | 127.5 | 9.5  | 12   | 9.5  | 70    |          |
| 7:30     | 127.5 | 9.5  | 12   | 9.5  | 82    |          |
| 8:30     | 127.5 | 9.5  | 12   | 9.5  | 94    |          |
| 9:30     | 127.5 | 9.5  | 12   | 9.5  | 106   |          |
| 10:30    | 127.5 | 9.5  | 12   | 9.5  | 118   |          |
| 11-4     | 127.5 | 9.5  | 12   | 9.5  | 124   |          |

note when  
any knots appear  
or break

Cent

Roundet Edge Hiss  
Put in dry 3 Minutes Revolve  
then full current on

#1 in Bath

Started Jan 16 20 at 11:30 AM

| Time     | Spd  | Volt | Amps | Emp | Total |
|----------|------|------|------|-----|-------|
| 11:30 AM | 1275 | 9.5  | 9.5  | 91  |       |
| 12:30    | 1275 | 9.5  | 9    | 92  | 9     |
|          |      |      |      |     |       |
| 1:30 PM  | 1275 | 9.5  | 9.1  | 92  | 18    |
| 2:30     | 1275 | 9.5  | 9    | 90  | 27    |
| 3:30     | 1275 | 9.5  | 9    | 90  | 36    |
| 4:30     | 1275 | 9.5  | 9.5  | 90  | 45    |
| 5:30     | 1275 | 9.5  | 9.5  | 90  | 55    |
| 6:30     | 1275 | 9.5  | 9.5  | 92  | 64    |
| 7:30     | 1275 | 9.5  | 9    | 91  | 73    |
| 8:30     | 1275 | 9.5  | 9    | 93  | 82    |
| 9:30     | 1275 | 9.5  | 9    | 93  | 91    |
| 10:30    | 1275 | 9.5  | 9    | 94  | 100   |
| 11 AM    | 1275 | 9.5  | 9    | 94  | 105   |

Transferred to  
#4 in Bath  
July 17, 20.  
105 amps  
in Bath

Duplicate of #1 Ni Bath  
 of July 16, 20, Oct 11 30 PM.

# #2 Ni Bath

Started July 16, 20 @ 12:30 PM

| Time     | Sp. Sv | Volts   | Amper | Temp | Stel |
|----------|--------|---------|-------|------|------|
| 11:30    | 1275   | 9.5     | 12    | 93   |      |
| 12:30 PM | 1275   | 9.5     | 11.5  | 92   | 12   |
|          |        | July 17 | 20    |      |      |
| 1:30 PM  | 1275   | 9.5     | 12    | 90   | 24   |
| 2:30     | 1275   | 9.5     | 12    | 90   | 36   |
| 3:30     | 1275   | 9.5     | 12    | 90   | 48   |
| 4:30     | 1275   | 9.5     | 12    | 92   | 60   |
| 5:30     | 1275   | 9.5     | 12    | 90   | 72   |
| 6:30     | 1275   | 9.5     | 11    | 90   | 83   |
| 7:30     | 1275   | 9.5     | 12    | 90   | 95   |
| 8:30     | 1275   | 9.5     | 12    | 92   | 107  |
| 9:30     | 1275   | 9.5     | 10.5  | 92   | 117  |
| 10:30    | 1275   | 9.5     | 10.5  | 92   | 128  |
| 11       | 1275   | 9.5     | 10.5  | 93   | 133  |

Transfer to  
 #7 Copper  
 Bath July 17, 20  
 133 Amps Ni  
 plated

Revolve 60 min. in Bath dry  
then full current on.

16/98 / 9.8  
Total Amp/20 98  
" - 10  
Average Amp = 9.8

#1 Ni Bath  
Started July 17 20 @ 12<sup>45</sup> PM.

| Time     | Sp. No. | Voltage | Amps | Temp | Total   |
|----------|---------|---------|------|------|---------|
| 12:45    |         |         |      |      |         |
| 12:45 PM | 1280    | 9.5     | 10   | 91   |         |
| 1:45     | 1280    | 9.5     | 10.5 | 94   | 10.     |
| 2:45     | 1280    | 9.5     | 10.5 | 94   | 21      |
| 3:45     | 1280    | 9.5     | 10.5 | 94   | 31      |
| 4:45     | 1280    | 9.5     | 10.5 | 100  | 42      |
| 5:45     | 1280    | 9.5     | 10   | 100  | 52      |
| 6:45     | 1280    | 9.5     | 10   | 100  | 62      |
| 7:45     | 1280    | 9.5     | 9    | 95   | 71      |
| 8:45     | 1280    | 9.5     | 9    | 95   | 80      |
| 9:45     | 1280    | 9.5     | 9    | 95   | 89      |
| 11:45    | 1280    | 9.5     | 9    | 95   | 98 Amp. |

Out

after 10 min  
Copper color  
on Ni disc  
no current

note how stopping

Transferring to  
#2 Copper,  
bath  
98 Amps first  
July 17 20  
at 10:45 PM

Duplicate of #1 Bath  
Expect screen in #2 Bath

7/27/11

Total Amps 77  
" hours 7  
" hours 11

#2 Bath

Started July 17, 20 @ 110 P.M.

Time Spent Volts Amps Temp Trial

|       |       |     |    |    |    |
|-------|-------|-----|----|----|----|
| 12:00 | 12:00 | 9.5 | 11 | 90 |    |
| 2:00  | 12:10 | 9.5 | 11 | 90 | 11 |
| 3:00  | 12:20 | 9.5 | 11 | 90 | 22 |
| 4:00  | 12:30 | 9.5 | 11 | 90 | 33 |
| 5:00  | 12:40 | 9.5 | 11 | 97 | 44 |
| 6:00  | 12:50 | 9.5 | 11 | 90 | 55 |
| 7:00  | 12:50 | 9.5 | 11 | 90 | 66 |
| 8:00  | 12:50 | 9.5 | 11 | 90 | 77 |

Out

after 10 min copper  
soln on disc  
No Current

Note Low-stripped

Cracked on edge  
off mould noticed  
about 4.00 P.m.

Transfer to #8  
Bath July 17-20  
77 Amps

Rounded edge disc put in dry  
3 minutes. Revolve then full  
current on

1/2 minute in cleaning Bath  
in 8-4  
washed in fresh water  
rinsed in distilled  
put in dry then put  
in nickel bath for 3 minutes  
with current off

10/25/85

Total Amps 85  
" hours 10  
Average Amps 8.5

# 1 Ni Bath

started July 18-20

| Time  | Volts | Amps | Amps | Total |
|-------|-------|------|------|-------|
| 2:00  | 1280  | 9.5  | 9    | 89    |
| 3:00  | 1286  | 9.5  | 9    | 91    |
| 4:00  | 1280  | 9.5  | 7    | 93    |
| 5:00  | 1280  | 9.5  | 9    | 93    |
| 6:00  | 1280  | 9.5  | 8.5  | 94    |
| 7:00  | 1280  | 9.5  | 8.5  | 94    |
| 8:00  | 1280  | 9.5  | 8.5  | 93    |
| 9:00  | 1280  | 9.5  | 8.5  | 93    |
| 10:00 | 1280  | 9.5  | 8.5  | 93    |

Measured standard  
for Green to ca  
2-30 AM.

Out Amp

stopped at  
10:00 AM on  
account of cracked  
disc

LN G

Rounded edge Disc  
Put in chpt 3 minutes Revolve  
Then full current on

same as No 1

10) 107 (10.7)

Total Amps = 107  
" hours = 10

Average Amps = 10.7

# No 2 Ni Bath  
started July 18 20

| Time  | Volts | Amps | Temp | Notes                     |
|-------|-------|------|------|---------------------------|
| 12:00 | 12.80 | 9.5  | 11.5 | 88                        |
| 1:00  | 12.80 | 9.5  | 11   | 89 11                     |
| 2:00  | 12.80 | 9.5  | 11   | 89 22                     |
| 3:00  | 12.80 | 9.5  | 11   | 89 33 Mottled Hardset     |
| 4:00  | 12.80 | 9.5  | 11   | 90 44 To Green at 3-15:00 |
| 5:00  | 12.80 | 9.5  | 11   | 90 55                     |
| 6:00  | 12.80 | 9.5  | 10.5 | 90 65                     |
| 7:00  | 12.80 | 9.5  | 10.5 | 90 76                     |
| 8:00  | 12.80 | 9.5  | 10.5 | 90 86                     |
| 9:00  | 12.80 | 9.5  | 10.5 | 90 97                     |
| 10:00 | 12.80 | 9.5  | 10.5 | 90 107 Amps               |

Out stopped on  
account of being  
Cracked

M.E.

Revised edge file  
Put in only 3 minutes reverse  
then full current on.

Total amp 78  
" hours 8  
Average amper 9.6 Per hour

# Ni Bath No 1

started July 18-20

| AM   | Lbs  | Volta | Amp | amp | total |
|------|------|-------|-----|-----|-------|
| 11   | 1280 | 9-5   | 10  | 94  |       |
| 12   | 1280 | 9-5   | 10  | 96  | 10    |
| 1-20 | 1280 | 9-5   | 10  | 96  | 20    |
| 2    | 1280 | 9-5   | 10  | 96  | 80    |
| 3    | 1280 | 9-5   | 10  | 96  | 40    |
| 4    | 1280 | 9-5   | 10  | 96  | 50    |
| 5    | 1280 | 9-5   | 9-5 | 55  | 54    |
| 6    | 1280 | 9-5   | 9-5 | 96  | 69    |
| 7    | 1280 | 9-5   | 9-5 | 96  | 78    |

Out. 78 - amp 8 hours

Transfer to No 5  
Copper Bath  
July 18-7-20  
in plate 48 amp



Rounded edge disc  
Put in 3rd 3 minutes rough  
then full current on

No 2 disc started to crack  
at 1.00 PM. July 18  
Taken Out at 2:30 Cracked on edge

Round Edge Disc

9) 97 / 10.7

Total Amps 100  
" hours  
Average amps

## A Ni Bath No 2

started July 18 - 26

| AM      | Volts | Amps | Amps | Total      |
|---------|-------|------|------|------------|
| 11      | 1280  | 9-5  | 92   |            |
| 12      | 1280  | 9-5  | 94   | 9          |
| PM 1:00 | 1280  | 9-5  | 10   | 94 19      |
| 2       | 1280  | 9-5  | 11   | 94 30      |
| 2:30    | 1280  | 9-5  | 11   | 94 35 Amps |

Out Cracked on edge

M.C

| AM   | Volts | Amps | Amps | Total | No 2 disc |
|------|-------|------|------|-------|-----------|
| 3:00 | 1280  | 9-5  | 11   | 54    |           |
| 4:00 | 1280  | 9-5  | 11   | 94    |           |
| 5    | 1280  | 9-5  | 11   | 95    | 22        |
| 6    | 1280  | 9-5  | 11   | 95    | 33        |
| 7    | 1280  | 9-5  | 11   | 95    | 44        |
| 8    | 1280  | 9-5  | 11   | 95    | 55        |
| 9    | 1280  | 9-5  | 11   | 95    | 66        |
| 10   | 1280  | 9-5  | 11   | 95    | 76        |
| 11   | 1280  | 9-5  | 11   | 95    | 86        |
| 12   | 1280  | 9-5  | 11   | 95    | 97        |

Transfer to  
# 6 Bath  
July 18, 20.  
12:40 PM.  
97 Amps Ni Bath

Round edge Disc put in  
dry 3 minutes in water then  
full current on

13  $\int$  127 (9.8  
16.0

Total Amps 127  
n hours 13  
Average Amps 9.8

Richard Bath 7121  
started July-18-20-

| Time | Volts   | Amps | Watts | Total |
|------|---------|------|-------|-------|
| 8:00 | 1280    | 9.5  | 9     | 96    |
| 9    | 1280    | 9.5  | 9     | 96    |
| 10   | 1280    | 9.5  | 9     | 96    |
| 11   | 1280    | 9.5  | 9     | 96    |
| 12   | 1280    | 9.5  | 9     | 96    |
| 1 PM | July 19 |      |       |       |
| 1:00 | 1280    | 9.5  | 9     | 96    |
| 2:00 | 1280    | 9.5  | 9     | 96    |
| 3:00 | 1280    | 9.5  | 10    | 96    |
| 4:00 | 1280    | 9.5  | 10.5  | 96    |
| 5:00 | 1280    | 9.5  | 10.5  | 96    |
| 6:00 | 1280    | 9.5  | 10.5  | 96    |
| 7:00 | 1280    | 9.5  | 10.5  | 100   |
| 8:00 | 1280    | 9.5  | 10.5  | 100   |
| 9    | 1280    | 9.5  | 10.5  | 100   |

Transferred  
# 3 Copper  
bath July 19, 20  
10.7 A.  
127 Amps

Sharp Edge disc  
Part in Hvy 3/4 minutes revolve  
then full experiment on.

~~8~~ 9/102 / 11.3  
9.2  
30  
Total Amps 102  
" hours 9  
Average Amps 11.3

Nickel Bath No 2  
Started July 19-20

| Time | SRGR | VOLTS | AMP  | TEMP | TOTAL |
|------|------|-------|------|------|-------|
| 1:00 | 1280 | 9.5   | 11.5 | 74   |       |
| 1:10 | 1280 | 9.5   | 11.5 | 74   | 11    |
| 1:20 | 1280 | 9.5   | 11.5 | 74   | 23    |
| 1:30 | 1280 | 9.5   | 11.5 | 74   | 34    |
| 1:40 | 1280 | 9.5   | 11.5 | 74   | 46    |
| 1:50 | 1280 | 9.5   | 11.5 | 74   | 57    |
| 2:00 | 1280 | 9.5   | 11.5 | 74   | 69    |
| 2:10 | 1280 | 9.5   | 11.5 | 74   | 80    |
| 2:20 | 1280 | 9.5   | 11.5 | 74   | 91    |
| 2:30 | 1280 | 9.5   | 11   | 78   | 102   |
| 2:40 | 1280 | 9.5   | 11   | 78   |       |
| 2:50 | 1280 | 9.5   | 11   | 78   |       |
| 3:00 | 1280 | 9.5   | 11   | 78   |       |

Ant

Transfer to  
#4 Copper  
bath July 1930  
10 hrs  
102 Amps

Start from July 19, 20.  
11 am all disc to be  
carried through marked as  
Ni Bath #1 H when transferred to Copper bath  
Should read ~~1 H-B~~  
Ni #1 H  
Copper #1 H-B

Started July 19, 20. 12:41 PM. Expen # 1-H.  
#1 Ni Bath for new disc.  
Revolve 2 min dry, then full current on  
Ran to 61 Amps, 5 hours.  
A kind wash, rinse with still water & whirl dry.

Cu #7 Bath Expe. 1-A-B  
Very full current on.  
New wood screen put in to replace  
the linen one - Added 800 cc H<sub>2</sub>SO<sub>4</sub> at  
66° Baume 6 P.M. July 20, to copper bath.  
Sppt Temp in copper should be dropped to  
117° @ 80°

Removed trees after 494 Amps.

Total Amps 666  
" hours 42  
Average amps 15.7

ni.

Started July 19, 20 - 12-AM.

Exp 2-A.

#2 in bath. Low voltage disc.

Revolves 2 min up, then full current on.

Low to 62 Amps .5 hrs.

Off, link, wash, rinse distill water and oil disc.

Remarks

There was too slight, what may develop to be blister, which appeared after 2 hours in nickel bath.



cu. #8 Bath

Exp 2-A-P.

Very full current on.

Added 800 cc H<sub>2</sub>SO<sub>4</sub> at 66° Baum.

July 20, 20. at 6 PM.

Hold copper bath to 117°C 80°.

Removed trees after 572 Amps

Total Amps 648

" Hours 36

Average Amps 18.

V

iii.

Started July 19, 20, - 5<sup>30</sup> PM.

Epp #3-A.

#1 Ni Bath, Jones disc.

Reverse 2 min dry, then full current  
disc, was finger marked before put  
into Ni bath.

Ran to 65 amps Ni plates = 6 1/2 hours.

lv.

#2 Bath.

Epp. 3-A-B

very full current on.  
new wood screen put in to replace  
the linen one which broke

Added 800 cc H<sub>2</sub>SO<sub>4</sub> at 66° Baume

July 20, 20. at 6 PM.

Held copper bath to 1170 @ 80°.

Removed trees after 456 amps.

Total Amps 626

" hours 42

Average Amps 14.9

$\frac{17}{530} \text{ hr}$   $\frac{20}{930} \text{ hr}$

$44 \left( \frac{720}{41} \right) 17.5$   
 $\frac{310}{220}$

M  
 Started July 19, 20, 5:20 P.M. Exp # 47.  
 #2 W. Bath. Concave disc.  
 Revolve 2 min. dry then full current on.  
 Row 181 Amps 16 hrs in plate. Hang over rack  
 after usual wash, or distill water, then dried.

6 hrs



Lw. # 6 Bath. Exp # 47B

Put in wet full current on.  
 Added 800 OH 2 SO<sub>4</sub> @ 66° Cume  
 July 20, 20, at 6 P.M.  
 Abolish soap for bath to 117° @ 80°

Total Amps = 720.

" Hours = 41

Average Amps = 17.5



45) 737 (16.3

in

Started July 19, 20 - 12 AM. Eys. 5 H.  
#1 Ni. Bath. Straight face side,  
Revolve 2 min. Am. then full current on  
Ran to 90 Amps in 16.3 hours.  
Wash, wash, rinse with water then dried and  
hung on rack. no room in upper bottle.  
19 hours



Ch. 8 Bath.

Eys. 5 H-B.

Put in wet, full current on  
Added 1000 cc  $H_2SO_4$  to upper bottle  
at 12 AM July 22, 20.

Total Amps 737  
" hours 45  
Average Amps 16.3





Started July 20, 20 @ 10 AM. Exp 6 H.  
Metal put in dry, reverse 2 min, then full current  
forward disc.  
Blisters appeared after in plating 3 hours  
at the extreme outer edge  
Taken out  
Ran to 45 amperes in plate  
4 hours plated.



Qu.

Exp 6. = 3

Was taken out of in bath and  
given to Mr. Edrich account of blisters.

~~Cut out~~

mi

Started July 20, 20 - 10 AM. Exp 7.7  
Bath Put in (dry), revolve 2 min, then full current  
conver. disc. Taken out, washed, wash  
rinse distilled water, dry & put in rack.  
Ran to 77 Amps in Plate, 7 hours

Hung in rack and put in Cu  
bath after 24 hrs on rack.

✓

Cu. Bath Exp 7.45  
Put in wet, full current, as  
added 1000 cc  $H_2SO_4$  to upper bath.  
July 22, 20, at 12 AM. Ran to 677 m.  
34 hours in Plate

Total Amps 677  
" hours 34  
Average Amps 17.3

✓

July 20, 20.

Put all  $\text{Ni}$  in wet  
1 Revolution through current,  $\text{Ni}$ ,  
Starting July 20, 20,  
at 3 P.M. Orders from Mr. Edison

Also all copper in  
wet

To be dried, then  
wet distilled water.

July 20, 20, 6 A.M.  
Added 800 cc  $\text{H}_2\text{SO}_4$

at 66° Baume to the  
Copper bath

Heated Sp. Gr. to 117° @ 80° C. Bath  
from July 20, 20 at 6 P.M. till  
further orders

$$\begin{array}{r}
 35 \overline{) 670} \\
 \underline{35} \phantom{0} \\
 320 \\
 \underline{35} \phantom{0} \\
 5
 \end{array}
 \quad \left| \begin{array}{l} 19.1 \\ 19.1 \end{array} \right.$$

$\text{Ni}$   
 Started July 20, 20 at 6 PM. Exp 8 #  
 #1 Ni Bath  
 Put in wet, put bottom then  
 full current on  
 Rm to 31 amperes in plate, 3 hours

$\swarrow$  Cont.

$\text{Cu}$  Bath #4 Exp 8 #B  
 Put in wet, full current on  
 Jaws taken off with pliers at  
 340 amperes Copper plate  
 Hold Copper bath at 190, Rm 1170  
 at 80° FRR.

$\swarrow$  Cont.

Total amperes 670  
 " hours 35  
 Average amperes 19.1

$$\begin{array}{r}
 39 \overline{) 632} \quad 16.2 \\
 \underline{39} \phantom{0} \\
 242 \\
 \underline{234} \phantom{0} \\
 80
 \end{array}$$

Ni.

Started July 20, 20 @ 6 P.M. E<sub>9</sub> 9 A.

#2 Ni bath

Put in wet, put belt on, then full current on.

Ran to 30 amperes, 3 hours Ni plates

✓

Cu Bath #3

E<sub>9</sub> 9 A.

Put in wet full current on.

Removed knots with pliers at 55.64 hrs.

added 1000 cc H<sub>2</sub>SO<sub>4</sub> to copper bath.

July 22, 20, at 12 A.M.

Total amperes 632  
 " hours 39  
 Average Amp 162

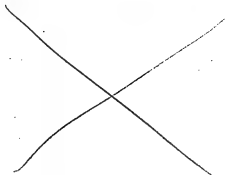
✓

July 20, 20. at 12 AM. Epp 10 H.  
#1 In bath  
put in wet, revolved 1 revolution,  
then full current  
Raw to 27 On 100. epp 10 H. plotted  
Started to strip in bath 1 hr 15 minutes  
after put in

Note stripped from disc with put in air

Cur # Bath

Epp 10 H.



July 20, 20, at 12 PM. Epp NA.

# 2 Bath

Put in dry, one revolution, then  
full current on.

Ran to 30 Amps shown in plot.

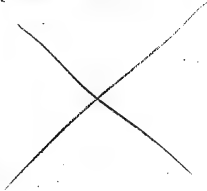
Showed signs of stripping. 1 hr. 15 minutes  
after put in.

Temp of # 10 A

Note stripped from disc, not put in in

Cu # Bath

Cy # A-B



ni

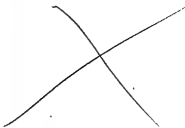
July 21, 20 at 10 AM Exp 12 #  
#100 Put in wet, revolve, once then full  
current on. Run 3 hours in Place  
Run to 7 Amps. — 1 hr in both  
Filed feather edge off disc.  
few scratches showed to him in plate also  
some blisters at outer edge  
Wood filter put in both.

Temp of #10 #1

Lat out account of shipping

Was not put in Cu. Bath.

Exp 12 A-B



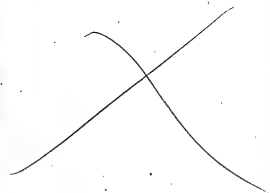


mi  
July 21, 20. @ 10.11.41. Expt #137.  
#2 Bath Put in wet, revolve piece, then  
full current on. Run 3 hrs in bath.  
Ran to 9.5 amps - 1 hr in bath.  
Filed feather edge off piece.  
Cracks started to show half hour after start in  
plating.

Sup. of #10 H.  
Has cut out account of stripping

Has not put in Cu. bath

Expt #138



Take V<sub>in</sub> reading & Temp.  
14A

| Time             | Sp. Dr. | Temp. | Volts | Amps | Notes |
|------------------|---------|-------|-------|------|-------|
| 12               | 1275    | 83    | 9.5   | 8    |       |
| 12 <sup>30</sup> | "       | 84    | "     | 8    | 8     |
|                  |         |       |       |      | Out   |

mi  
July 21, 20 @ 12 AM. Eps 14A  
10th. Put in wet, revolve once, then  
put full current on.  
Ran to 8 Amps. Ni Plated.  
Started to peel 1/2 hour after plated.

M.G.

Temp. of # 10A

Take  $\frac{1}{2}$  hr reading on temp.  
15 H.

| Time | Sp. No. | Temp. | Voltage | Amper. | Total |
|------|---------|-------|---------|--------|-------|
| 12   | 1275    | 83    | 9.5     | 9.5    |       |
| 1280 | "       | 84    | 9.5     | 9.5    | 9.5   |
|      |         |       |         |        | Out   |

July 21, 20. @ 12 AM. Exp 15 H  
#288 Put in wet. Revolve med. then  
full current on.  
Started to show blister at 15 min after  
put in bath.  
Rm to 9.5 Amp/22. Lamp of 10 H.

N.G.  
This was the sixth disc tried  
out with same results

Temp. before adding the  
166°F Ni. Sol. = 88°F

| EXP # | BATH | Sp   | Ck  | TEMP | VOLT | AMP | Total | TIME |
|-------|------|------|-----|------|------|-----|-------|------|
| 16A   | 1    | 1270 | 92  | 9.5  | 7    | 8   | 3     |      |
|       |      | 1270 | 95  | 10   | 8.5  | 8   | 4     |      |
|       |      |      | 95  | 10   | 9    | 17  | 5     |      |
|       |      |      | 100 | 10   | 9    | 26  | 6     |      |

3 || 26 (8.2) *Out*  
Total amps 26  
" hours 3  
Average amps 8.2

|     |   |      |     |     |      |    |   |
|-----|---|------|-----|-----|------|----|---|
| 17A | 2 | 1270 | 92  | 9.5 | 8    | 3  |   |
|     |   | 1270 | 95  | 10  | 11.5 | 11 | 4 |
|     |   | "    | 95  | 10  | 11.5 | 23 | 5 |
|     |   | "    | 95  | 10  | 11.5 | 34 | 6 |
|     |   | "    | 101 |     |      |    |   |

3 || 34 || 11.3

*Out*

mi  
July 21, 20. at 3 PM. Exp 16A  
#1 Bath.

Put in wet, one revolution then full  
current on. Did not show any  
sign of stripping. Ran to 26 Amps in 16 to 3 hrs.

Strong coil put around outside of  
bath to keep temp constant  
Hold to 100-105° FAHR.  
Voltage raised to 10.  
was 9.5



July 21, 20. at 3 PM. Exp 17A.  
Heaps of 17 #

Started to strip after 45 min  
in mi bath around edges

Ran to 34 amps  
3 hrs in plated



Total Amps 34  
" hours 3  
Average amps 11.3



| EXP # | BATH | SP   | GR  | TEMP | VOLT | AMP | TOTAL |
|-------|------|------|-----|------|------|-----|-------|
| 18A   | 1    | 1270 | 105 | 10   | 9    | 9   | 6 PM  |
|       | "    | "    | 105 | "    | 9    | 9   |       |
|       |      |      | 105 | "    | 9    | 18  |       |
|       |      |      | 105 | "    | 9    | 27  |       |
|       |      |      | 105 | "    | 9    | 9   |       |

Total Amps  
" hours  
Average Amps

Out

|     |   |      |     |    |      |    |
|-----|---|------|-----|----|------|----|
| 19A | 2 | 1270 | 104 | 10 | 11.5 | 6  |
|     |   |      | 106 | "  | 11.5 | 12 |
|     |   |      | 104 | "  | 11   | 22 |
|     |   |      | 103 | "  | 11   | 83 |
|     |   |      | 105 | "  | 11   | 9  |
|     |   |      | 102 | "  | 11   | 9  |

Total Amps  
" hours  
Average Amps

Out

July 21, 20 @ 6 PM  
Run 3 hrs in Plate.  
Put in wet, one revolution then full  
current on.



Exp: 19A  
Run 3 hrs in Plate  
Duplicate of # 18 A  
Added 10000 Hrs to 24000 bath  
July 22, 20, at 12 PM



| EXP | BATH | SP. GR. | TEMP   | VOLT. | AMP. | TOTAL | TIME |
|-----|------|---------|--|-------|------|-------|------|
| 20H | 1    | 1270    | 104<br>100<br>100<br>102<br>102<br>102<br>102<br>102 | 10    | 40   | 10    | 9 PM |
|     |      |         |  | "     | 10   | 10    |      |
|     |      |         |  | "     | 10   | 20    | 11   |
|     |      |         |  | "     | 10   | 30    | 12   |
| Out |      |         |  |       |      |       |      |

Total Amps 30  
" 5 hrs  
Average Amps 10

| EXP | BATH | SP. GR. | TEMP   | VOLT. | AMP. | TOTAL | TIME |
|-----|------|---------|--|-------|------|-------|------|
| 21A | 2    | 1270    | 100<br>100<br>100<br>100<br>100<br>100<br>100<br>100 | 10    | 11-5 | 9     |      |
|     |      |         |  | "     | 11-5 | 12    | 10   |
|     |      |         |  | "     | 11-5 | 23    | 11   |
|     |      |         |  | "     | 11-5 | 35    | 12   |
| Out |      |         |  |       |      |       |      |

Total Amps 35  
" 5 hrs  
Average Amps 11.5  
3 1/2  
1 1/2

July 21, 20. @ 9 PM. Exp 20H  
Put in wet, revolve piece, then  
full current on



Exp 21A.  
Duplicate of #20H.



| EXP   | BATH | Sp. Gr. | TEMP  | VOLT | AMP. | TOTAL | Time-AM  |
|---|------|---------|---|------|------|-------|----------|
| 22 A  | 1    | 1270    | 103<br>100<br>100<br>100<br>100<br>100<br>100 | 16   | 9-5  | 9     | 12       |
|   |      | "       | "   | "    | 9-5  | 19    | 1 1/2 PM |
|   |      |         |   |      | 4-5  | 28    | 2 AM     |
|   |      |         |   |      | 9-5  | 3     |          |
|   |      |         |   |      |      | Out   |          |
| Total Amps 28<br>" hours 3<br>Average Amps 9.5  |      |         |   |      |      |       |          |
| 23 A  | 2    | 1270    | 100<br>99<br>100<br>100<br>100<br>100<br>100  | 10   | 11-5 | 12    | 12 PM    |
|   |      | "       | "   | "    | 11-5 | 23    | 1 1/2 PM |
|   |      |         |   |      | 11-5 | 35    | 2        |
|   |      |         |   |      |      | 3     |          |
|   |      |         |   |      |      | Out   |          |
| Total Amps 35<br>" hours 3<br>Average Amps 11.5 |      |         |   |      |      |       |          |

July 22, 20 July 21, 20 at PM. Exp 22  
 Put in and run the one  
 then Current on

Exp 23 A  
 Duplicate of #22 A

| EXP #        | BATH  | Sp. Gr. | TEMP | VOLT. | AMP. | TOTAL |
|--------------|-------|---------|------|-------|------|-------|
| 4 PM         | 1     | 1260    | 110  | 9.5   | 11.5 | 11.5  |
| 5            | "     | "       | "    | "     | 11.5 | 11.5  |
| 6            | "     | "       | 115  | "     | 11.5 | 2.3   |
| 7            | "     | "       | 118  | "     | 11.5 | 3.4   |
| 8            | "     | "       | "    | "     | 11.5 | 4.6   |
| 9            | "     | "       | "    | "     | 11.5 | 5.7   |
| 10           | "     | "       | "    | "     | 11.5 | 6.9   |
| 11           | "     | 1265    | "    | "     | 11.5 | 8.0   |
| 12           | "     | "       | "    | "     | 11.5 | 9.2   |
| July 3, 1911 | 1, 20 | "       | "    | "     | "    | 6.5   |
| 1 AM         | "     | 1260    | "    | 10.0  | 10.2 | 10.2  |
| EXP #2       | #2    | 1260    | 118  | 9.5   | 13   | 13    |
| 7 PM         | "     | "       | "    | "     | 13   | 13    |
| 8            | "     | "       | "    | "     | 13   | 26    |
| 9            | "     | "       | "    | "     | 13   | 39    |
| 10           | "     | "       | "    | "     | 13   | 52    |
| 11           | 1265  | "       | "    | "     | 13   | 65    |
| 12           | "     | "       | "    | "     | 13   | 78    |
| July 3, 1911 | "     | "       | "    | "     | 13   | 91    |
| 2            | "     | "       | "    | "     | 13   | 104   |
| 8/10/11      | "     | "       | "    | "     | 13   | 117   |

Memo.

Started July 30, 20 at 4 PM. Exp 24H.

1 Bath

Run 4 hrs faced dissect female Moore's Nodul  
15 seconds in cleaning bath could not avoid pinning  
nodul & put in solution  
15 " " 8/4 Plate in 100 Amps put in wet  
current off, after 1 revolution put in wet  
fixed Alka Rubber, Copper put in wet  
current on, strips and put back  
15 seconds cleaner - 15 seconds 8/4 and  
keep on as many times as you saw.

Total Amps 102  
Average Amps 11.5

Started July 30, 20 at 6 PM. Exp 25H

#2 Bath

1 duplicate of Exp #24H

Total Amps 104  
" hours 8  
Average Amps 13

Out



Egg 26# Bath #1

Temp of Egg 24 H. Except  
molds given preliminary  
brushing before going into  
electric chamber.

10/103/10

Egg 27# Bath #2

Temp of Egg 24 H  
Same treatment as above

1120

July 31, 9 AM

| Exp 26# | Time | Sp. Gr | Temp | Volt | Amp  | Total |
|---------|------|--------|------|------|------|-------|
| 1       | 9 AM | 1.250  | 98   | 9.5  | 9    |       |
| Bath    | 10   | "      | 102  | "    | 9.5  | 9     |
|         | 11   | "      | 108  | "    | 10.  | 19    |
|         | 12   | "      | 115  | "    | 10.5 | 30    |
|         | 1    | "      | 115  | "    | 10.5 | 40    |
|         | 2    | "      | "    | 9.5  | 10.5 | 51    |
|         | 3    | "      | 107  | "    | 10.1 | 61    |
|         | 4    | "      | "    | "    | 10.5 | 72    |
|         | 5    | "      | "    | "    | 10.5 | 82    |
|         | 6    | "      | "    | "    | 10.5 | 93    |
|         | 7    | "      | "    | "    | 10.5 | 103   |

Total Amperes  
" hours 10  
Average amp 10

Out

| Exp 27# | Time | Sp. Gr | Temp | Volt | Amp  | Total |
|---------|------|--------|------|------|------|-------|
| 1       | 9 AM | 1.260  | 100  | 9.6  | 10.5 |       |
| Bath    | 10   | "      | 103  | "    | 11.0 | 11    |
|         | 11   | "      | 108  | "    | 12.0 | 23    |
|         | 12   | "      | 113  | "    | 12.5 | 35    |
|         | 1    | "      | 115  | "    | 12.5 | 48    |
|         | 2    | "      | "    | "    | 12   | 60    |
|         | 3    | "      | "    | "    | 12   | 72    |
|         | 4    | "      | 100  | "    | 12   | 84    |
|         | 5    | "      | "    | "    | 12   | 96    |
|         | 6    | "      | "    | "    | 12   | 108   |
|         | 7    | "      | "    | "    | 12   | 120   |

2 small  
blister  
developed  
at 2 PM.

Out

Total Amperes 120  
" hours 10  
Average Amperes 12

Eps 28H 15 second in cleaner then

then plays and  
put back

stripping  
#1 Bath

#1 Ni Bath. in Eps 28H

#1 Ni Bath started

| TIME  | BATH | SP. GR. | TEMP. | VOLT | AMP | TOTAL    |
|-------|------|---------|-------|------|-----|----------|
| 7     |      | 170     | 90    | 9    | 9   |          |
| 8     |      |         |       |      | 9   |          |
| 9     |      |         |       |      | 9   |          |
| 10    |      |         | 93    |      | 9   |          |
| 11    |      |         |       |      | 9   |          |
| 12    |      | 175     | 104   | 9.5  | 10  | 43       |
| 1     |      |         |       |      | 10  | 20       |
| 2     |      |         |       |      | 10  | 30       |
| 3     |      |         |       |      | 10  | 40       |
| 4     |      |         |       |      | 9.5 | 44       |
| 5     |      |         |       |      | 9   | 58       |
| 6     |      |         |       |      | 9   | 67       |
| 7     |      |         |       |      | 9   | 76       |
| 8     |      | 105     |       |      | 9   | 85       |
| 9     |      |         |       |      | 8.5 | 94       |
| 10    |      |         |       |      |     |          |
| 10:30 | 1760 | 100     | 95    | 10   |     | 3rd time |
| 11:30 | "    | "       | "     | 10   |     | "        |
| 12:30 | "    | "       | "     | 10   |     | "        |
| 1:30  | "    | "       | "     | 10   |     | "        |
| 2:30  | "    | "       | "     | 10   |     | "        |
|       |      |         |       |      | 50  |          |

Aug 1, 30

1st stripping

Aug 1, 30

out 2nd time

Aug 2, 30

out 3rd time

#1 Bath in

Exp 25 #

| Exp    | Time | Sp. Gr. | Temp | Volt | Amper | Total |
|--------|------|---------|------|------|-------|-------|
| Aug 28 | 4:30 | 1.068   | 103  | 9.5  | 10    |       |
|        | 5:30 | "       | "    | "    | 10    | 10    |
|        | 6:30 | "       | 107  | "    | 10    | 20    |
|        | 7:30 | "       | 107  | "    | 8     | 38    |
|        | 8:30 | "       | "    | "    | 8     | 46    |

4th  
stripping  
out

|        |       |         |      |      |       |       |             |
|--------|-------|---------|------|------|-------|-------|-------------|
| Aug 29 | 12:45 | 1270    | 1    |      |       |       | no 2nd bath |
|        | Time  | Sp. Gr. | Temp | Volt | Amper | Total | 5th         |
|        | 11:30 | 1290    | 9.5  | 9.5  | 10    |       | stripping   |
|        | 12:30 | "       | "    | 9.5  | 10    | 10    |             |
| Aug 3  |       |         |      |      |       |       |             |
|        | 1:30  | "       | 100  | "    | 10    | 20    |             |
|        | 2:30  | "       | "    | "    | 10    | 30    |             |
|        | 3:30  | "       | 102  | "    | "     | -     |             |
|        | 4:30  | "       | "    | "    | 10    | 50    |             |
|        | 5:30  | "       | "    | "    | 10.5  | 60    |             |
|        | 6:30  | "       | "    | "    | 10.5  | 71    |             |
|        | 7:30  | "       | 105  | "    | 10.5  | 81    |             |
|        | 8:30  | "       | "    | "    | 10.5  | 91    | out         |

|       |       |      |     |     |   |    |           |
|-------|-------|------|-----|-----|---|----|-----------|
| Aug 3 | 10:45 | 1275 | 103 | 9.5 | 9 | 9  | 6th       |
|       | 11    | "    | "   | "   | " | 18 | stripping |
|       | 12    | 1270 | 104 | "   | 9 | 27 |           |
|       | 1     | "    | "   | "   | 9 | 35 | out       |

| #1 Bath in |       |    |      |     |       |    | Epi 25th |  |
|------------|-------|----|------|-----|-------|----|----------|--|
| TIME       | After | Sw | Wash | Any | Total |    | 7th      |  |
| 3 PM       | 15    | 70 | 106  | 9.5 | 10    |    | Stopping |  |
| 4          | "     | "  | "    | "   | 10    | 10 |          |  |
| 5          | "     | "  | 107  | 9   | 10    | 20 |          |  |
| 6          | "     | "  | "    | "   | 10    | 30 |          |  |
| 7          | "     | "  | 106  | 8.5 | 10    | 40 |          |  |
|            |       |    |      |     |       |    | Out      |  |
|            |       |    |      |     |       |    | 8th      |  |
| 8 30       | 17    | 70 | 105  | 10  | 10    |    | Stopping |  |
| 9 30       | "     | "  | "    | "   | 10    | 20 |          |  |
| 10 30      | "     | "  | "    | "   | 10    | 30 |          |  |
| 11 30      | "     | "  | "    | "   | "     | "  |          |  |
| 12         | "     | "  | "    | "   | "     | "  |          |  |
|            |       |    |      |     |       |    | Out      |  |
|            |       |    |      |     |       |    | 9th      |  |
| 1 PM       | 27    | 0  | 103  | 9.5 | 9     |    | Stopping |  |
| 2          | "     | "  | 103  | 11  | 8.5   | 8  |          |  |
| 3          | "     | "  | "    | "   | 3.5   | 16 |          |  |
| 4          | "     | "  | "    | "   | 6.5   | 25 |          |  |
| 5          | "     | "  | "    | "   | 8.5   | 33 |          |  |
| 6          | "     | "  | 105  | "   | 8.5   | 42 |          |  |
| 7          | "     | "  | "    | "   | 6.5   | 50 |          |  |
| 8          | "     | "  | "    | "   | 8.5   | 69 | 9 1st    |  |
|            |       |    |      |     |       |    | 10th     |  |
| 10         | 10    | 70 | 103  | 9   | 9     | 9  | Stopping |  |
| 11         | "     | "  | "    | "   | 9     | 18 |          |  |
| 12         | "     | "  | 105  | "   | 9     | 27 |          |  |
| 1          | "     | "  | "    | "   | 9     | 36 |          |  |
| 2          | "     | "  | "    | "   | 9     | 36 | Out      |  |

Copper Baths

Aug 4, 20 } added 100cc  
general Bath dope

Aug 5, 20 } added 20cc  
general Bath dope

#1 Bath in

Exp 287

| Date  | TIME    | Sp   | gr  | Jump | Volt | Amp | Total     | num | s/y |
|-------|---------|------|-----|------|------|-----|-----------|-----|-----|
| Aug 4 | 3 PM    | 1270 | 108 | 9.5  | 10   | 20  | 11th      |     |     |
|       | 4       | "    | "   | "    | 10   | 20  | 11th      |     |     |
|       | 5       | "    | 105 | "    | 10   | 30  | stripping |     |     |
|       | 6       | "    | "   | "    | 10   | 40  |           |     |     |
|       | 7       | "    | "   | "    | 10   | 50  | Out       |     |     |
| Aug 4 | 7:30 PM | 1260 | 108 | 9.5  | 10   |     | 12th      |     |     |
|       | 8:30    | "    | "   | "    | 10   |     |           |     |     |
|       | 9:30    | "    | "   | "    | 10   |     | stripping |     |     |
|       | 11:30   | "    | "   | "    | 10   |     |           |     |     |
|       | 11:30   | "    | "   | "    | 10   | 40  | Out       |     |     |
| Aug 4 | 12      | 1260 | 104 | 9.5  | 10   |     | 13th      |     |     |
| Aug 5 | 1       | "    | "   | "    | 9.5  | 9   | stripping |     |     |
|       | 2       | "    | "   | "    | 8.5  | 17  |           |     |     |
|       | 3       | "    | "   | "    | 8.5  | 26  |           |     |     |
|       | 4       | "    | "   | "    | 8.5  | 34  | Out       |     |     |
| Aug 5 | 4:30    | 1260 | 102 | 9.5  | 8    |     | 14th      |     |     |
|       | 5:30    | "    | 106 | "    | 8.5  |     | stripping |     |     |
|       | 6:30    | "    | "   | "    | 8.5  | 17  |           |     |     |
|       | 7:30    | "    | "   | "    | 8.5  | 25  |           |     |     |
|       | 8:30    | "    | "   | "    | 9    | 34  | Out       |     |     |
| Aug 5 | 9:30 PM | 1270 | 100 | 9    | 9    |     | 15th      |     |     |
|       | 10:30   | "    | "   | "    | 9    | 9   |           |     |     |
|       | 11:30   | "    | 102 | "    | 9    | 18  |           |     |     |
|       | 12:30   | "    | 105 | "    | 9    | 27  |           |     |     |
|       | 1:30 PM | "    | "   | "    | 9    | 36  | Out       |     |     |

## #1 Bath

Egg 2077

| EXP   | TIME  | Sp. gr. | Temp. | V. det. | W. det. | W. det. | W. det. |
|-------|-------|---------|-------|---------|---------|---------|---------|
| Aug 5 | 2.15  | 1280    | 108   | 9.5     | 9.5     | 9.5     | 9.5     |
|       | 3.15  | 1280    | 108   | 9.0     | 9.0     | 9.0     | 9.0     |
|       | 4.15  | 1280    | 108   | 9.0     | 10      | 19      | 30      |
|       | 5.15  | "       | "     | "       | 10.5    | 30      | 41      |
|       | 6.15  | "       | "     | "       | 10.5    | 41      | 41      |
| Aug 5 | 7.00  | 1280    | 106   | 9.5     | 10      | 10      | 10      |
|       | 8.00  | "       | "     | "       | 10      | 10      | 22      |
|       | 9.00  | "       | "     | "       | 10      | 10      | 32      |
|       | 10.00 | "       | "     | "       | 10      | 10      | 32      |
|       | 11.00 | "       | "     | "       | 10      | 10      | 42      |
| Aug 5 | 12.00 | 1280    | 106   | 9.5     | 10      | 10      | 10      |
|       | 13.00 | "       | "     | "       | 10      | 10      | 20      |
|       | 14.00 | "       | 105   | "       | 10      | 10      | 30      |
|       | 15.00 | "       | "     | "       | 10      | 10      | 30      |
|       | 16.00 | "       | "     | "       | 10      | 10      | 40      |
| Aug 6 | 17.00 | 1280    | 106   | 9.5     | 10      | 10      | 10      |
|       | 18.00 | "       | "     | "       | 10      | 10      | 20      |
|       | 19.00 | "       | "     | "       | 10      | 10      | 30      |
|       | 20.00 | "       | "     | "       | 10      | 10      | 30      |
|       | 21.00 | "       | "     | "       | 10      | 10      | 46      |

Stopped fifteen min. to fix pump

19th

Stripping

Out

19th

Stripping

Out

## #2 Bats

Exp 297

| EXP 297 | TIME | Sp. g. | Temp | Volts | Amp  | Total |                                 |
|---------|------|--------|------|-------|------|-------|---------------------------------|
|         | 7    | 170    | 90   | 9     | 8    |       |                                 |
|         | 8    |        |      |       | 9    |       |                                 |
|         | 9    |        | 93   |       | 9    |       |                                 |
|         | 10   |        | "    |       | 9    |       |                                 |
|         | 11   |        |      |       | 10   | 44    | Aug 120,<br>not shipping        |
|         | 1130 | 175    | 109  | 9.5   | 10   |       |                                 |
|         | 1230 |        |      |       | 10   | 20    |                                 |
|         | 130  |        |      |       | 10   | 30    |                                 |
|         | 230  |        |      |       | 10   | 40    |                                 |
|         | 330  |        |      |       | 9.5  | 49    |                                 |
|         | 430  |        |      |       | 9    | 58    |                                 |
|         | 530  |        |      |       | 9    | 67    |                                 |
|         | 630  |        |      |       | 9    | 76    |                                 |
|         | 730  |        |      |       | 9    | 85    |                                 |
|         | 830  | 105    |      |       | 8.5  | 94    | Aug 120<br>sent 2nd<br>shipment |
|         | 930  |        |      |       |      |       |                                 |
|         | 1030 | 1260   | 102  | 9.5   | 11.5 |       |                                 |
|         | 1130 | "      | "    | "     | 11.5 |       |                                 |
|         | 1230 | "      | 104  | "     | 11.0 |       |                                 |
|         | 130  | "      | 107  | "     | 11.0 |       |                                 |
|         | 730  | "      | 107  | "     | 11.  | 510   | Aug 3<br>not shipped            |

# #2 Bath N

Epp #297

| Exp    | Time  | Sig. | Temp | Volts | Amperes | Notes         |
|--------|-------|------|------|-------|---------|---------------|
|        | 4:30  | 176  | 103  | 9.5   | 11.5    |               |
|        | 5:30  | "    | "    | "     | 11.5    | 4th stripping |
|        | 6:30  | "    | "    | "     | 11.5    | Aug 20        |
|        | 7:30  | "    | "    | "     | 12      | 23            |
|        | 8:30  | "    | "    | "     | 12      | 35            |
| Aug 2  | 11:30 | 1280 | 96   | 9.5   | 8       | Out           |
| Aug 3  | 12:30 | "    | "    | "     | 8       |               |
|        | 1:30  | "    | 100  | "     | 8       | 5th stripping |
|        | 2:30  | "    | "    | "     | 8       | 16            |
|        | 3:30  | "    | "    | "     | 8       | 24            |
|        | 4:30  | "    | "    | "     | 8       | 32            |
|        | 5:30  | 102  | "    | "     | 8       | 40            |
|        | 6:30  | "    | "    | "     | 8       | 48            |
|        | 7:30  | 105  | "    | "     | 8       | 56            |
|        | 8:30  | "    | "    | "     | 8       | 64            |
| Aug 3  | 10:30 | 1275 | 105  | 9.5   | 10.5    | Out           |
|        | 11    | "    | "    | "     | 11.5    | 6th           |
|        | 12    | 1270 | 104  | "     | 11.5    | 22            |
|        | 1:30  | "    | "    | "     | 11.5    | 34            |
|        | 2     | "    | "    | "     | 10.5    | 45            |
| Aug 20 | 3     | 1270 | 107  | 9.5   | 11      | Out           |
|        | 4     | "    | "    | "     | 11      | 10            |
|        | 5     | "    | "    | 9     | 11      | 21            |
|        | 6     | "    | 108  | "     | 10      | 31            |
|        | 7     | "    | 107  | 8.5   | 10      | 41            |



Aug. 4, 20 at 1 PM,  
 8-4  
 added more to  
 fetch per per strength

# #2 Bottom

Eggs 29A

| Exp   | Time  | Depth                         | Time | Water | Temp | Notes          |
|-------|-------|-------------------------------|------|-------|------|----------------|
| Aug 3 | 8:30  | 1770                          | 106  | 80    | 12   | get stripping  |
|       | 9:30  | "                             | "    | "     | 11   | 16             |
|       | 10:30 | "                             | "    | "     | 11   | 22             |
|       | 11:30 | "                             | "    | "     | 11   | 33             |
|       | 12:30 | "                             | "    | "     | 11   | 44             |
| Aug 4 | 1 PM  | 1270                          | 104  | 75    | 11   | Out            |
|       | 2     | "                             | 105  | "     | 10   | 9th stripping  |
|       | 3     | "                             | "    | "     | 10   | 20             |
|       | 4     | "                             | "    | "     | 10   | 31             |
|       | 5     | "                             | "    | "     | 10   | 41             |
|       | 6     | "                             | "    | "     | 10   | 51             |
|       | 7     | "                             | 106  | "     | 10   | 61             |
|       | 8     | "                             | "    | "     | 10   | 71             |
| Aug 4 | 10 PM | 1270                          | 104  | 9     | 10   | Out            |
|       | 11    | "                             | "    | 9     | 10   | 10th stripping |
|       | 12    | "                             | 105  | "     | 10   | 20             |
|       | 1     | "                             | "    | "     | 10   | 30             |
|       | 2     | "                             | "    | "     | 10   | 40             |
| Aug 4 | 3     | 1270                          | 104  | 9.5   | 11   | Out            |
|       | 4     | "                             | "    | "     | 11   | 27             |
|       | 5     | "                             | 106  | "     | 11   | 33             |
|       | 6     | "                             | "    | "     | 10   | 43             |
|       | 7     | "                             | "    | "     | 10   | 53             |
| 1 PM  | 10:50 | Added 8-4 to per per strength |      |       |      |                |

#2 Bottom

Egg 29H

| Aug 4 | TIME  | Sp/Sec | Temp | Volt | Amp | Total            |
|-------|-------|--------|------|------|-----|------------------|
|       | 7:30  | 1160   | 108  | 9.5  | 11  | 12 <sup>th</sup> |
|       | 8:20  | 11760  | "    | "    | 11  | Stripping        |
|       | 9:20  | "      | "    | "    | 11  |                  |
|       | 10:20 | "      | "    | "    | 11  |                  |
|       | 11:20 | "      | "    | "    | 11  | 46               |

| Aug 5 | TIME | Sp/Sec | Temp | Volt | Amp  | Total            |
|-------|------|--------|------|------|------|------------------|
|       | 12   | 1260   | 105  | 9.5  | 10.5 | 13 <sup>th</sup> |
|       | 1:10 | "      | "    | "    | 10   | 10 Stripping     |
|       | 2    | "      | "    | "    | 10   | 20               |
|       | 3    | "      | "    | "    | 10   | 30               |
|       | 4    | "      | "    | "    | 10   | 40 Out           |
|       | 5    |        |      |      |      |                  |
|       | 6    |        |      |      |      |                  |

| Aug 5 | TIME | Sp/Sec | Temp | Volt | Amp | Total       |
|-------|------|--------|------|------|-----|-------------|
|       | 4:30 | 1260   | 103  | 9.5  | 10  | 74 Out      |
|       | 5:30 | "      | 104  | "    | 9.5 | 7 Stripping |
|       | 6:30 | "      | "    | "    | 9.5 | 17          |
|       | 7:30 | "      | "    | "    | 9.5 | 28          |
|       | 8:30 | "      | "    | "    | 9   | 34 Out      |

| Aug 5 | TIME  | Sp/Sec | Temp | Volt | Amp | Total            |
|-------|-------|--------|------|------|-----|------------------|
|       | 9:30  | 1270   | 102  | 9    | 9   | 15 <sup>th</sup> |
|       | 10:30 | "      | 103  | "    | 9.5 | 9 Stripping      |
|       | 11:30 | "      | 104  | "    | 9.5 | 17               |
|       | 12:30 | "      | 107  | 9.5  | 9.5 | 28               |
|       | 1:30  | "      | 107  | 9    | 9.5 | 38 Out           |

20.00 Added double dose pen. bath. dose

# 2 Bath. W.

Est 29H

| EXPR           | TIME  | sq gr | Temp | water | comp | total |
|----------------|-------|-------|------|-------|------|-------|
| Aug 5          | 2:15  | 1280  | 108  | 9.5   | 2.5  |       |
|                | 3:15  | "     | "    | "     | 9.5  | 7.5   |
|                | 4:15  | "     | "    | 9.5   | 10   | 19    |
|                | 5:15  | "     | "    | "     | 10.5 | 30    |
|                | 6:15  | "     | "    | "     | 10.5 | 41    |
| Aug 5          | 7     | 1280  | 108  | 9.5   | 10.5 |       |
|                | 8     | "     | "    | "     | 10   | 10    |
|                | 9     | "     | "    | "     | 10   | 20    |
|                | 11    | "     | "    | "     | 10   | 30    |
| Aug 5<br>Aug 6 | 11:30 | 1280  | 108  | 9.5   | 10.5 |       |
|                | 12:30 | "     | "    | "     | 10.5 | 10    |
|                | 1:30  | "     | 108  | "     | 10   | 20    |
|                | 2:30  | "     | "    | "     | 10   | 30    |
|                | 3:45  | "     | "    | "     | 10   | 40    |
| Aug 6          | 4     | 1280  | 108  | 9.5   | 10   |       |
|                | 5     | "     | "    | "     | 10   | 10    |
|                | 6     | "     | "    | "     | 10   | 20    |
|                | 7     | "     | "    | "     | 10   | 30    |
|                | 8     | "     | "    | "     | 10   | 40    |

17# stripping  
16# stripping  
out

17# stripping  
out  
18th stripping  
out

# # 3 Bath. Cu Exp 30 B.

| EXPT | TIME | Sy g | Temp | Volts | Amp  | Total | 1st time in |
|------|------|------|------|-------|------|-------|-------------|
|      | 4 PM | 1170 | 80   | 9.5   | 18   |       | Aug. 30.    |
|      | 5    | "    | 84   | 8.5   | 18   | 18    |             |
|      | 6    | "    | "    | "     | 18.5 | 36    |             |
|      | 7    | "    | "    | "     | 19   | 55    |             |
|      | 8    | "    | "    | "     | 19   | 74    | Out         |

|       |      |      |     |     |   |    |           |
|-------|------|------|-----|-----|---|----|-----------|
| Aug 6 | 9 AM | 1265 | 100 | 9.5 | 9 |    | #1 Bath   |
|       | 10   | "    | "   | "   | 9 | 9  | 19th      |
|       | 11   | "    | 102 | "   | 9 | 18 | stripping |
|       | 12   | "    | "   | 9   | 9 | 27 |           |
|       | 1 PM | "    | "   | 9   | 9 | 36 |           |

|          |       |      |     |   |   |    |           |
|----------|-------|------|-----|---|---|----|-----------|
| Aug 6 20 | 12 PM | 1265 | 105 | 9 | 9 |    | #1 Bath   |
|          | 230   | 1270 | 107 | " | 9 | 9  | in        |
|          | 330   | "    | "   | " | 9 | 18 | 20th      |
|          | 430   | "    | "   | " | 9 | 27 | stripping |
|          | 530   | "    | "   | " | 9 | 36 |           |

|          |      |      |     |   |     |     |              |
|----------|------|------|-----|---|-----|-----|--------------|
| Aug 6 20 | 7 PM | 1270 | 109 | 9 | 9.5 |     | #1 Bath      |
|          | 8    | "    | "   | " | 9.5 | 9.5 | in           |
|          | 9    | "    | "   | " | 9.5 | 19  | 21 stripping |
|          | 10   | "    | "   | " | 9.5 | 28  |              |
|          | 11   | "    | "   | " | 9.5 | 38  |              |

# # 4 Bath. Cu. Exp 31B

| EXPT | TIME | g   | Temp | Volts | amps | Total |             |
|------|------|-----|------|-------|------|-------|-------------|
|      | 4 PM | 170 | 80   | 9.5   | 15   | 15    | 1st time in |
|      | 5    | "   | 84   | 8.5   | 15.5 | 31    | Aug. 31.    |
|      | 6    | "   | "    | "     | 16   | 47    |             |
|      | 7    | "   | "    | "     | 16   | 63    | Out         |

|        |      |      |     |     |     |    |            |
|--------|------|------|-----|-----|-----|----|------------|
| Aug 1, | 9 AM | 1265 | 101 | 9.5 | 9   | 9  | #2 in Bath |
|        | 10   | "    | "   | "   | 9   | 9  | 19th       |
|        | 11   | "    | 103 | "   | 9   | 18 | Shipping   |
|        | 12   | "    | 102 | 9-  | 9   | 27 |            |
|        | 1 PM | "    | "   | 9-  | 9.5 | 36 | Out        |

|       |         |  |  |  |  |  |          |
|-------|---------|--|--|--|--|--|----------|
| Aug 6 | 1:30 PM |  |  |  |  |  | #2 B. th |
|       | 2:30    |  |  |  |  |  | 20th     |
|       | 3:30    |  |  |  |  |  | Shipping |
|       | 4:30    |  |  |  |  |  |          |
|       | 5:30    |  |  |  |  |  | Out      |

|       |         |      |     |    |    |    |          |
|-------|---------|------|-----|----|----|----|----------|
| Aug 6 | 6:30 AM | 1770 | 107 | 9- | 10 | 10 | #2 Bath  |
|       | 7:30    | 1770 | "   | "  | 10 | 10 | Shipping |
|       | 8:30    | "    | "   | "  | 10 | 20 | #2       |
|       | 9:30    | "    | "   | "  | 10 | 30 |          |
|       | 10:30   | "    | "   | "  | 10 | 40 | Out      |

# 5 Butte Cu Exp # 32 B.

| Exp | Time | Temp | W. T. | Temp | W. T. | 1st time in |
|-----|------|------|-------|------|-------|-------------|
|     | 4 PM | 170  | 80    | 95   | 17    | Aug 3, 20.  |
|     | 5    | "    | 84    | 85   | 17.5  | 35          |
|     | 6    | "    | "     | "    | 18    | 53          |
|     | 7    | "    | "     | "    | 18    | 71          |
|     | 8    | "    | "     | "    | 18    | 71          |

Cont

# 6 Bath Cu Eps 33 B

|      |     |    |     |      |                |
|------|-----|----|-----|------|----------------|
| 4 PM | 170 | 80 | 9.5 | 16   | not there in   |
| 5    | "   | 84 | 8.5 | 16.5 | 16 Aug. 3, 20. |
| 6    | "   | "  | "   | 16.5 | 33             |
| 7    | "   | "  | "   | 17   | 50             |
| 8    | "   | "  | "   | 17   | 67 Cent        |

# 7 Bath

Egg 34 B

DATE  
Exp

| TIME | gpa  | Temp | Volts | Comp | Total |
|------|------|------|-------|------|-------|
| 4 PM | 1170 | 83   | 9.5   | 15   |       |
| 5    | "    | 84   | 8.5   | 16.5 | 16    |
| 6    | "    | "    | "     | 16.5 | 33    |
| 7    | "    | "    | "     | 16.5 | 49    |
| 8    | "    | "    | "     | 16.5 | 66    |

 1st time in  
 Aug. 3, 20.

Out



# #1 Bath Nickel Plate

DATE Aug 6

| Exp   | Time  | Temp | Volt | Amp | Total | #1 Bath       |
|-------|-------|------|------|-----|-------|---------------|
|       | 12:00 | 1270 | 107  | 9.5 | 10    | Nickel        |
| Aug 7 | 1:00  | "    | "    | "   | 10    | 2.1 stripping |
|       | 2:00  | "    | "    | "   | 10    | 2.0           |
|       | 3:00  | "    | "    | "   | 9     | 2.9           |
|       | 4:00  | "    | "    | "   | 9     | 2.8           |
|       |       |      |      |     |       | Cut           |
| Aug 7 | Time  | Temp | Volt | Amp | Total | 2.1 stripping |
|       | 4:30  | 1276 | 107  | 9.5 | 10    |               |
|       | 5:30  | "    | "    | "   | 10    | 1.1 stripping |
|       | 6:30  | "    | "    | "   | 10    | 2.0           |
|       | 7:30  | "    | "    | "   | 10    | 3.0           |
|       | 8:30  | "    | "    | "   | 10    | 4.0           |
|       |       |      |      |     |       | Cut           |
| Aug 7 | 8:30  | 1270 | 105  | 9.5 | 9     | Bath #1       |
|       | 9:30  | "    | "    | "   | 9     | 3.2           |
|       | 10:30 | "    | "    | "   | 9     | 1.8 stripping |
|       | 11:30 | "    | "    | "   | 9     | 2.7           |
|       | 12:30 | "    | "    | "   | 9     | 3.6           |
|       |       |      |      |     |       | Cut           |
| Aug 7 | 1:30  | 1270 | 103  | 9.5 | 10    | 1.1           |
|       | 2:30  | "    | "    | "   | 10    | 2.1           |
|       | 3:30  | "    | 105  | "   | 10    | 2.0 stripping |
|       | 4:30  | "    | "    | "   | 10    | 3.0           |
|       | 5:30  | 108  | "    | "   |       | Cut           |

# #2 Bath in Plate

DATE Aug 6

| Exp   | Time  | Temp | Volts | Amp | Total | #2 Bath       |
|-------|-------|------|-------|-----|-------|---------------|
|       | 1200  | 1270 | 107   | 9.5 | 1     | 10            |
| Aug 7 | 1.00  | "    | "     | "   | 10    | 10            |
|       | 2.00  | "    | "     | "   | 10    | 20            |
|       | 3.00  | "    | "     | "   | 10    | 30            |
|       | 4.00  | "    | "     | "   | 10    | 40            |
|       |       |      |       |     |       | Out           |
| Aug 7 | TIME  | Temp | Volts | Amp | Total | #2 Bath       |
|       | 4.30  | 1275 | 110   | 9.5 | 11    | 2.5 Stripping |
|       | 5.30  | "    | "     | "   | 11    | 11            |
|       | 6.30  | "    | "     | "   | 10    | 21            |
|       | 7.30  | "    | "     | "   | 10    | 31            |
|       | 8.30  | "    | "     | "   | 10    | 41            |
|       |       |      |       |     |       | Out           |
| Aug 7 | 9.30  | 127  | 104   | 7.5 | 10    | 10            |
|       | 9.30  | "    | "     | "   | 10    | 20            |
|       | 10.30 | "    | "     | "   | 10    | 30            |
|       | 11.30 | "    | "     | "   | 10    | 40            |
|       | 12.30 | "    | "     | "   | 10    | 50            |
|       |       |      |       |     |       | Out           |
| Aug 7 | 1.30  | 1270 | 105   | 9.5 | 11    | #2 Bath       |
|       | 2.30  | "    | "     | "   | 11    | 2.5 Stripping |
|       | 3.30  | "    | 105   | "   | 11    | 11            |
|       | 4.30  | "    | "     | "   | 11    | 21            |
|       | 5.30  | "    | 111   | "   | 10    | 31            |
|       | 6.30  | "    | "     | "   | 10    | 41            |
|       | 7.30  | "    | "     | "   | 10    | 51            |
|       | 8.30  | "    | "     | "   | 10    | 61            |
|       |       |      |       |     |       | Out           |

# #2 Bath Ni Plate

| Date  | Time  | Sp. H. | Temp | Volts | Amps |       |
|-------|-------|--------|------|-------|------|-------|
| Aug 7 | 11:30 | 127.0  | 110  | 9.5   | 11   | 26th  |
|       | 12:00 | "      | "    | "     | 16   | Strip |
|       | 1:30  | "      | "    | "     | 10   | Aug   |
|       | 2:00  | "      | "    | "     | 10   |       |
|       | 3:30  | "      | "    | "     | 10   |       |
| Aug 8 | 4     | 127.0  | 111  | 9.5   | 18   | 27th  |
|       | 5     | "      | "    | "     | 10   | Strip |
|       | 6     | "      | "    | "     | 10   | Aug   |
|       | 7     | "      | "    | "     | 10   |       |
|       | 8     | "      | "    | "     | 10   |       |
| Aug 8 | 9     | 127.0  | 110  | 9.5   | 28   | 28th  |
|       | 10    | 125.5  | 110  | 8.5   | 9    | Strip |
|       | 11    | 125.5  | 110  | 8.0   | 17   | Aug   |
|       | 12    | "      | "    | "     | 25   |       |
|       | "     | "      | "    | "     | 32   |       |
| Aug 9 | 2:40  | 126.0  | 107  | 8     | 4    | 29th  |
|       | 3:45  | "      | "    | "     | 18.8 | Strip |
|       | 4:45  | "      | "    | "     | 27   | Aug   |
|       | 5:45  | 126.0  | 110  | 9.5   | 36   |       |
|       | 6     | "      | 113  | 9     |      |       |

# #1 Bath Ni Plate

| DATE  | Time    | Sp. H. | Temp | Volts | Amps |    | #1 Bath      |
|-------|---------|--------|------|-------|------|----|--------------|
| Aug 7 | 6:00 PM | 128.0  | 108  | 9.5   | 10   | 10 | 25 stripping |
|       | 7       | "      | "    | "     | 10   | 20 |              |
|       | 8       | "      | "    | "     | 10   | 30 |              |
|       | 9       | "      | "    | "     | 10   | 40 |              |
|       | 10      | "      | "    | "     | 11   | 42 | Out          |
| Aug 7 | 11:30   | 127.5  | 107  | 9.5   | 15   | 15 | #1 Bath      |
|       | 12:30   | "      | "    | "     | 15   | 20 | 25 stripping |
|       | 1:30    | "      | "    | "     | 15   | 30 |              |
|       | 2:30    | "      | "    | "     | 15   | 40 | Out          |
|       | 3:30    | "      | "    | "     | 15   | 42 |              |
| Aug 8 | 4       | 127.0  | 105  | 9.5   | 10   | 10 | #1 Bath      |
|       | 5       | "      | "    | "     | 10   | 20 | 27 strip     |
|       | 6       | "      | "    | "     | 10   | 30 | Aug          |
|       | 7       | "      | "    | "     | 10   | 40 | Out          |
|       | 8       | "      | "    | "     | 10   | 42 |              |
| Aug 8 | 9       | 127.0  | 105  | 8.5   | 10   | 70 | 28th         |
|       | 10      | 125.5  | 110  | 8     | 9    | 18 | Strip        |
|       | 11      | 125.5  | 110  | 8     | 8.5  | 27 | Aug          |
|       | 12      | "      | "    | "     | 8.5  | 35 | Out          |
|       | 1       | "      | "    | "     | 8.5  |    |              |

| # 2 Nickel |       |       |       |       |      |       |
|------------|-------|-------|-------|-------|------|-------|
| Date       | Time  | Spent | Spent | Volts | Amps | Notes |
| Aug 8      | 7:45  | 1:20  | 60    | 113   | 9    | 29th  |
|            | 8:45  | "     | "     | "     | 54   |       |
|            | 9:45  | "     | "     | "     | 63   | Stop  |
|            | 10:45 | "     | "     | "     | 72   | WV    |
|            | 11:45 | "     | "     | "     |      |       |

Removed after 29th time  
in Ni bath & with  
7.2 amp hrs. Ni. and  
put in Copper bath  
with full current on.

| # 1 Nickel Bath |       |       |       |       |      |       |
|-----------------|-------|-------|-------|-------|------|-------|
| Date            | Time  | Spent | Spent | Volts | Amps | Notes |
| Aug 8           | 7:45  | 1:20  | 60    | 113   | 9    | 29th  |
|                 | 8:45  | "     | "     | "     | 54   |       |
|                 | 9:45  | "     | "     | "     | 63   | Stop  |
|                 | 10:45 | "     | "     | "     | 72   | WV    |
|                 | 11:45 | "     | "     | "     |      |       |

|       |       |   |   |   |    |     |
|-------|-------|---|---|---|----|-----|
| Aug 8 | 7:45  | " | " | " | 49 |     |
|       | 8:45  | " | " | " | 52 |     |
|       | 9:45  | " | " | " | 61 |     |
|       | 10:45 | " | " | " | 70 | but |

Removed on 29th time  
in bath after 7.5 amp hrs.  
and put in Cu bath #4  
with full current on.

Note = 30cc Cu<sup>2+</sup> added 10 AM.  
20 cc. " " 3 PM

N.G.  
 Stuck coming off  
 and had to bend  
 to straps from

| # 2 Bath in  |       |         |       |      |      |  |
|--------------|-------|---------|-------|------|------|--|
| Aug. 10, 20. |       |         |       |      |      |  |
| DATE         | TIME  | Sp. gr. | Temp. | Volt | Amp. | Total  |
| Exp.         |       |         |       |      |      | Remarks  |
|              | 10 AM | 1.280   | 100   | 8    | 9    | 9  |
|              | 11    | "       | "     | "    | 9    | 9  |
|              | 12    | "       | 106.5 | 9.5  | 9.5  | 18   |
|              | 1 PM  | "       | 108.8 | "    | 9.5  | 28   |
|              | 2     | "       | 109   | "    | 10   | 38   |
|              | 3     | "       | "     | 9    | 9    | 47   |
|              | 4     | "       | "     | "    | "    | 56   |
|              | 5     | "       | "     | "    | "    | 65   |
|              | 6     | "       | "     | "    | 9.5  | 75   |
|              | 7     | "       | "     | "    | 9.5  | 84   |
|              | 8     | "       | "     | 8.5  | 9.5  | 94   |
|              | 9     | 1.265   | 110   | 8.5  | 9    | 103  |
|              |       |         |       |      |      | Cont.  |
|              |       |         |       |      |      | Transfer test of<br>L. P. in Bath  |
|              |       |         |       |      |      | Mr Edison<br>wants to play the<br>mattie chair when<br>it is back up with<br>L. P. in. |

#1 Bath in Exp 36A

DATE Aug. 10, 20.

| TIME | Sp. Gr. | Temp. | Volta | amp | Total | Remanence     |
|------|---------|-------|-------|-----|-------|---------------|
| 1030 | 1280    | 100   | 8     | 9   |       |               |
| 1130 | "       | 105   | 9     | 10  | 10    | Back is       |
| 1230 | "       | 108   | 7.5   | 10  | 20    | not furnished |
| 1300 | "       | 110   | "     | 10  | 30    | Aug. 11, 20.  |
| 230  | "       | "     | "     | 10  | 40    |               |
| 330  | "       | "     | 9     | 9.5 | 49    |               |
| 430  | "       | "     | "     | 9.5 | 59    |               |
| 530  | "       | "     | "     | 9.5 | 68    |               |
| 630  | "       | "     | "     | 9.5 | 77    |               |
| 730  | "       | "     | "     | 9.5 | 87    |               |
| 830  | 1265    | 108   | 8.5   | 9   | 96    |               |
| 930  | "       | "     | "     | 9   | 105   | Out           |

Transfer to #2  
Lopper bath.

Mr Edison wants to play this metal disc when it is backed up with Lopper.

| # 1 Bath m                 |         |       |      |      |    |       |         | Eps 37A |  |
|----------------------------|---------|-------|------|------|----|-------|---------|---------|--|
| DATE Aug 11, 1920 at 10 AM |         |       |      |      |    |       |         |         |  |
| TIME                       | Sp. gr. | Temp. | Vit. | Alk. | pH | Total | Remarks |         |  |
| 10 AM                      | 12.5    | 108   | 8.5  |      |    | 9     |         |         |  |
| 11                         | "       | "     | "    |      |    | 9     |         |         |  |
| 12                         | "       | 109   | "    |      |    | 9     |         |         |  |
| 1 PM                       | 127.0   | "     | "    |      |    | 27    |         |         |  |
| 2                          | "       | "     | 8    |      |    | 36    |         |         |  |
| 3                          | "       | 106   | "    |      |    | 45    |         |         |  |
| 4                          | "       | "     | "    |      |    | 54    |         |         |  |
| 5                          | "       | 105   | "    |      |    | 63    |         |         |  |
| 6                          | "       | "     | "    |      |    | 71    |         |         |  |
| 7                          | "       | 102   | "    |      |    | 79    |         |         |  |
| 8                          | "       | "     | "    |      |    | 87    |         |         |  |
| Out                        |         |       |      |      |    |       |         |         |  |

Transfer to  
#5 Copper  
bath

| DATE          | TIME  | IN   | OUT | REMARKS |
|---------------|-------|------|-----|---------|
| Aug 11, 28, @ | 10 AM | 1265 | 110 | 85      |
|               | 11    | "    | "   | "       |
|               | 12    | 1270 | 109 | "       |
|               | 1 PM  | "    | "   | "       |
|               | 2     | "    | "   | "       |
|               | 3     | "    | "   | "       |
|               | 4     | "    | 107 | "       |
|               | 5     | "    | "   | "       |
|               | 6     | "    | "   | "       |
|               | 7     | "    | 104 | "       |

This disc was polished.  
 Room to 80  
 Application  
 back up  
 with paper  
 and sticks  
 to be given  
 to Mr. Dixon  
 to play the  
 metal disc.

Transfer to  
 # 60 Upper  
 bath



F 1 Bath  
NOTE

Epp 39#

10. 1270 104 9. 14

Aug. 13, 20

Runs Min  
then back up  
with upper  
lower house  
and strips  
to pencil  
dentistry

Put in #7 Cu Bath  
Run for 4 hours.  
did not show any  
dents after stripping

Start #1 Bath m. Egg 40 H  
Aug 13 20. at 12 AM.

| TIME  | Sp. W | Inf | Volt | Amps | Total | Remarks      |
|-------|-------|-----|------|------|-------|--------------|
| 12 AM | 1290  | 105 | 8.5  | 9    |       | Put in dry   |
| 1 PM  | "     | "   | "    | 8.5  | 9     | 1 revolution |
| 2     | "     | "   | "    | 8.5  | 15    | thin current |
| 3     | "     | "   | "    | 8.5  | 26    | on, run to   |
| 4     | "     | "   | "    | 8.5  | 35    | 40 amps.     |
| 5     | "     | "   | "    | 8.   | 43    |              |

Get  
to type

No dents appeared

Put in 22 Bldg Aug 14 1944  
2:30 P.M.  
1st. Strips from machine

Duplicate of above Egg 41 A-  
Sept put in 22 Bldg Bathes

|        |      |     |     |     |  |            |
|--------|------|-----|-----|-----|--|------------|
| Aug 13 | 1290 | 102 | 8.5 | 6.5 |  | Put in dry |
| 8      |      |     |     | 6.5 |  | 1/2        |
| 9      |      |     |     | 6.5 |  | Out        |
| 10     |      |     |     | 6.5 |  | current on |
| 11     |      |     |     | 6.5 |  | for dents  |
| 12     |      |     |     | 6.5 |  |            |

Dup of Egg #41 A  
Water to the above.  
Egg 42 H.

|        |      |     |     |     |  |             |
|--------|------|-----|-----|-----|--|-------------|
| Aug 13 | 1290 | 102 | 8.5 | 6.5 |  | Put in dry  |
| 8      |      |     |     | "   |  | 1 rev. then |
| 9      |      |     |     | "   |  | current on  |
| 10     |      |     |     | "   |  | for dents   |
| 11     |      |     |     | "   |  |             |
| 12     |      |     |     | "   |  |             |

1/2  
Out  
Egg

Put in 1st strip from this

22 Bdg  
2 P.M.

Put in 22 Bdg  
4 P.M.  
2nd strip from skin

# Bath

Egg #43H

| Exp    | TIME    | Sp. Gr. | Imp | Volt | Amp | Intal | Remarks        |
|--------|---------|---------|-----|------|-----|-------|----------------|
| Aug 13 | 9:30 AM | 1265    | 102 | 8.5  | 6.5 |       | Put in wet     |
|        | 10:30   |         |     |      |     |       | 1 rev, then    |
|        | 11:30   |         |     |      |     |       | current on     |
|        | 12:30   |         |     |      |     | 33    | Egg for cloths |
| Aug 14 | 1:30    |         |     |      |     | Out   |                |
| Aug 13 | 9:30 AM | 1265    | 102 | 8.5  | 6.5 |       | Egg #44H       |
|        | 10:30   |         |     |      |     |       | Put in wet     |
|        | 11:30   |         |     |      |     |       | 1 rev, then    |
|        | 12:30   |         |     |      |     | 33    | current on     |
| Aug 14 | 1:30    |         |     |      |     | Out   | Egg for cloths |
| Aug 14 | 2:30 AM | 1270    | 102 | 8.5  | 6.5 |       | Egg #41H       |
|        | 3:30    |         |     |      |     |       | Put in dry     |
|        | 4:30    |         |     |      |     |       | 1 rev, then    |
|        | 5:30    |         |     |      |     |       | current on     |
|        | 6:30    |         |     |      |     | 46    |                |
|        | 7:30    |         |     |      |     | Out   |                |
|        | 8:30    |         |     |      |     |       |                |
| Aug 14 | 2:30 AM | 1270    | 102 | 8.5  | 6.5 |       | Egg #42H       |
|        | 3:30    |         |     |      |     |       | Put in dry     |
|        | 4:30    |         |     |      |     |       | 1 rev, then    |
|        | 5:30    |         |     |      |     |       | current on     |
|        | 6:30    |         |     |      |     | 46    |                |
|        | 7:30    |         |     |      |     | Out   |                |
|        | 8:30    |         |     |      |     |       |                |

Put in 22 Bld  
2nd stripping from skin  
4 P.M.

Experiment  
3rd stripping

# # Bath

| Exp #  | TIME   | Sp. gr.                                      | Temp                         | Vital Amps | Current                                   | Remarks  |
|--------|--|--|------------------------------|------------|---|--|
| Aug 14 | 22 <sup>30</sup><br>23 <sup>00</sup><br>23 <sup>30</sup><br>24 <sup>00</sup><br>24 <sup>30</sup><br>25 <sup>00</sup><br>25 <sup>30</sup><br>26 <sup>00</sup><br>26 <sup>30</sup> | 1270   | 102                          | 8.5        | 6.5                                       | Eggs 43 H<br>Put in wet<br>1 row, then full<br>current on    |
|        |  |  |                              |            | 46  | Out  |
| Aug 15 | 23 <sup>30</sup><br>24 <sup>00</sup><br>24 <sup>30</sup><br>25 <sup>00</sup><br>25 <sup>30</sup><br>26 <sup>00</sup><br>26 <sup>30</sup><br>27 <sup>00</sup><br>27 <sup>30</sup> | 1270   | 102                          | 8.5        | 6.5                                       | Eggs 44 H<br>Put in wet<br>1 row, then<br>full current<br>on |
|        |  |  |                              |            | 46  | Out  |
| Aug 16 | 1 <sup>30</sup><br>2 <sup>00</sup><br>2 <sup>30</sup><br>3 <sup>00</sup><br>3 <sup>30</sup><br>4 <sup>00</sup><br>4 <sup>30</sup><br>5 <sup>00</sup><br>5 <sup>30</sup>          | 1270   | 98<br>"<br>102<br>104<br>99  | 8.5        | 6<br>6<br>6<br>6<br>6<br>6<br>6<br>6<br>6 | Eggs 43 H<br>Put in wet<br>1 row, then full<br>current on    |
|        |  |  |                              |            | 42  | Out at   |
| Aug 17 | 1 <sup>30</sup><br>2 <sup>00</sup><br>2 <sup>30</sup><br>3 <sup>00</sup><br>3 <sup>30</sup><br>4 <sup>00</sup><br>4 <sup>30</sup><br>5 <sup>00</sup><br>5 <sup>30</sup>          | 1270<br>"<br>"<br>"<br>"<br>"<br>"<br>"<br>" | 98<br>"<br>102<br>105<br>107 | 8.5        | 6<br>6<br>6<br>6<br>6<br>6<br>6<br>6<br>6 | Eggs 44 H<br>Put in wet<br>1 row, then full<br>current on    |
|        |  |  |                              |            | 42  | Out at   |

Start Aug. 15, 20 @ 6<sup>30</sup> AM

Exp #3 H

| TIME               | Sp. Vol. | Surf. Vol. | Temp. | Int. | Remarks       |
|--------------------|----------|------------|-------|------|---------------|
| 6 <sup>30</sup> AM | 1265     | 105        | 6.5   | 6    | 250 °C. core. |
| 7 <sup>30</sup>    | 1265     | 108        | 7     | 6    | 6             |
| 8 <sup>30</sup>    | 1265     | 108        | 7     | 6    | 12            |
| 9 <sup>30</sup>    | 1270     | 108        | 7     | 6    | 18            |
| 10 <sup>30</sup>   | 1270     | 108        | 7     | 6    | 24            |
| 11 <sup>30</sup>   | 1270     | 108        | 7     | 6    | 30            |
| 12 <sup>30</sup>   | 1270     | 108        | 7     | 6    | 36            |

Stopping  
This disc was  
cleaned with small hand brush  
before put in Elect. Chamber.

Start Bath in Egg 44#  
 Aug 15, 20 @ 6.40. PM.

| Time  | Temp  | Volts | Amperes |   |
|-------|-------|-------|---------|---|
| 6:40  | 126.5 | 105   | 6.5     | 6 |
| 7:40  | 126.5 | 105   | 7       | 6 |
| 8:40  | 127.0 | 105   | 7       | 6 |
| 9:40  | 127.0 | 105   | 7       | 6 |
| 10:40 | 127.0 | 105   | 7       | 6 |
| 11:40 | 127.0 | 105   | 7       | 6 |
| 12:40 | 127.0 | 105   | 7       | 6 |

Temperature

of Egg 44#

12

18

24

30

36

42

48

54

60

66

72

78

84

90

96

102

108

114

120

126

132

138

144

150

156

162

168

174

180

186

192

198

204

210

216

222

228

234

240

246

252

258

264

270

276

282

288

294

300

306

312

318

324

330

336

342

348

354

360

366

372

378

384

390

396

402

408

414

420

426

432

438

444

450

456

462

468

474

480

486

492

498

504

510

516

522

528

534

540

546

552

558

564

570

576

582

588

594

600

606

612

618

624

630

636

642

648

654

660

666

672

678

684

690

696

702

708

714

720

726

732

738

744

750

756

762

768

774

780

786

792

798

804

810

816

822

828

834

840

846

852

858

864

870

876

882

888

894

900

906

912

918

924

930

936

942

948

954

960

966

972

978

984

990

996

1002

1008

1014

1020

1026

1032

1038

1044

1050

1056

1062

1068

1074

1080

1086

1092

1098

1104

1110

1116

1122

1128

1134

1140

1146

1152

1158

1164

1170

1176

1182

1188

1194

1200

1206

1212

1218

1224

1230

1236

1242

1248

1254

1260

1266

1272

1278

1284

1290

1296

1302

1308

1314

1320

1326

1332

1338

1344

1350

1356

1362

1368

1374

1380

1386

1392

1398

1404

1410

1416

1422

1428

1434

1440

1446

1452

1458

1464

1470

1476

1482

1488

1494

1500

1506

1512

1518

1524

1530

1536

1542

1548

1554

1560

1566

1572

1578

1584

1590

1596

1602

1608

1614

1620

1626

1632

1638

1644

1650

1656

1662

1668

1674

1680

1686

#11 Battle N Exp 43A

DATE Aug 16-20 3:30AM

| EXP # | TIME  | Wgt  | Temp | Volts | Amps | Total | Remarks          |
|-------|-------|------|------|-------|------|-------|------------------|
|       | 3:30  | 1280 | 105  | 9.5   | 10   |       |                  |
|       | 4:30  | 1280 | 105  | 9.5   | 10   | 10    | Temp of 4th      |
|       | 5:30  | 1280 | 105  | 9.5   | 10   | 20    | chip body approx |
|       | 6:30  | 1280 | 104  | 9.5   | 10   | 30    | resect to 10 amp |
|       | 7:30  | 1280 | 108  | 9.5   | 9.5  | 39    |                  |
|       | 8:30  | 1270 | 107  | 9.5   | 9.5  | 49    |                  |
|       | 9:30  | "    | "    | "     | 9    | 58    |                  |
|       | 10:30 | "    | "    | "     | 9    | 67    |                  |

Cont

Transfer to  
#699 Battle Cu  
at 24 R/Lg  
12/11/12 Hds.  
at 11:30M  
Aug 16 20.  
2 R/P.M.

#2 Bath Ni' Exp 44A

DATE Start Aug 16-20 3-30 AM

| EXP# | TIME  | g    | Imp | Volts | Amp | Total | Remarks      |
|------|-------|------|-----|-------|-----|-------|--------------|
|      | 3.30  | 1280 | 105 | 9.5   | 10  |       |              |
|      | 4.30  | 1280 | 105 | 9.5   | 10  | 10    | 5th striping |
|      | 5.30  | 1280 | 105 | 9.5   | 10  | 20    | disinfectant |
|      | 6.30  | 1280 | 105 | 9.5   | 10  | 30    | 4th striping |
|      | 7.30  | 1280 | 105 | 9.5   | 9.5 | 39    | water raised |
|      | 8.30  | 1270 | 107 | 9.5   | 9.5 | 49    | to 16 Amps   |
|      | 9.30  | "    | "   | "     | 9.  | 58    |              |
|      | 10.30 | "    | "   | "     | 9.  | 67    |              |

Cut  
Transfer to  
#698 Bath  
11 Amps home.  
Oct 11.30 AM.  
Aug 16, 20,  
2 RPM



Tarnish removed by benzole, dried on  
Rubber coated by Fred Abbott.  
Polished on machine  
Washed in washer + Brushed with  
Standard Brush. (Brady has it),  
then rinse distill water.

Elec. Cleaned 15 seconds

Washed, rinsed distill water, then  
one minute in 8/11 washed rinsed  
distill water and put in bath wet

one revolution, then current on  
Run to 70 Amp hours and stop

Be careful in stripping, not to  
mar the Edge

Have it examine under  
microscope.

| #   | DATE                  | TIME | Volts | Amps | Total | Remarks  |
|-----|-----------------------|------|-------|------|-------|----------|
| 1   | Bath Ni               |      |       |      |       | Exp 45 H |
| 2   | Aug 16, 20 at 5:30 AM | 6 PM | 120   | 107  | 9.5   | 10       |
| 3   | "                     | "    | "     | "    | "     | 10       |
| 4   | "                     | "    | 105   | "    | "     | 10       |
| 5   | "                     | "    | "     | "    | "     | 10       |
| 6   | "                     | "    | 104   | "    | "     | 10       |
| 7   | "                     | "    | "     | "    | "     | 10       |
| 8   | "                     | "    | "     | "    | "     | 10       |
| 9   | "                     | "    | "     | "    | "     | 10       |
| 10  | "                     | "    | "     | "    | "     | 10       |
| 11  | "                     | "    | "     | "    | "     | 10       |
| 12  | "                     | "    | "     | "    | "     | 10       |
| 13  | "                     | "    | "     | "    | "     | 10       |
| 14  | "                     | "    | "     | "    | "     | 10       |
| 15  | "                     | "    | "     | "    | "     | 10       |
| 16  | "                     | "    | "     | "    | "     | 10       |
| 17  | "                     | "    | "     | "    | "     | 10       |
| 18  | "                     | "    | "     | "    | "     | 10       |
| 19  | "                     | "    | "     | "    | "     | 10       |
| 20  | "                     | "    | "     | "    | "     | 10       |
| 21  | "                     | "    | "     | "    | "     | 10       |
| 22  | "                     | "    | "     | "    | "     | 10       |
| 23  | "                     | "    | "     | "    | "     | 10       |
| 24  | "                     | "    | "     | "    | "     | 10       |
| 25  | "                     | "    | "     | "    | "     | 10       |
| 26  | "                     | "    | "     | "    | "     | 10       |
| 27  | "                     | "    | "     | "    | "     | 10       |
| 28  | "                     | "    | "     | "    | "     | 10       |
| 29  | "                     | "    | "     | "    | "     | 10       |
| 30  | "                     | "    | "     | "    | "     | 10       |
| 31  | "                     | "    | "     | "    | "     | 10       |
| 32  | "                     | "    | "     | "    | "     | 10       |
| 33  | "                     | "    | "     | "    | "     | 10       |
| 34  | "                     | "    | "     | "    | "     | 10       |
| 35  | "                     | "    | "     | "    | "     | 10       |
| 36  | "                     | "    | "     | "    | "     | 10       |
| 37  | "                     | "    | "     | "    | "     | 10       |
| 38  | "                     | "    | "     | "    | "     | 10       |
| 39  | "                     | "    | "     | "    | "     | 10       |
| 40  | "                     | "    | "     | "    | "     | 10       |
| 41  | "                     | "    | "     | "    | "     | 10       |
| 42  | "                     | "    | "     | "    | "     | 10       |
| 43  | "                     | "    | "     | "    | "     | 10       |
| 44  | "                     | "    | "     | "    | "     | 10       |
| 45  | "                     | "    | "     | "    | "     | 10       |
| 46  | "                     | "    | "     | "    | "     | 10       |
| 47  | "                     | "    | "     | "    | "     | 10       |
| 48  | "                     | "    | "     | "    | "     | 10       |
| 49  | "                     | "    | "     | "    | "     | 10       |
| 50  | "                     | "    | "     | "    | "     | 10       |
| 51  | "                     | "    | "     | "    | "     | 10       |
| 52  | "                     | "    | "     | "    | "     | 10       |
| 53  | "                     | "    | "     | "    | "     | 10       |
| 54  | "                     | "    | "     | "    | "     | 10       |
| 55  | "                     | "    | "     | "    | "     | 10       |
| 56  | "                     | "    | "     | "    | "     | 10       |
| 57  | "                     | "    | "     | "    | "     | 10       |
| 58  | "                     | "    | "     | "    | "     | 10       |
| 59  | "                     | "    | "     | "    | "     | 10       |
| 60  | "                     | "    | "     | "    | "     | 10       |
| 61  | "                     | "    | "     | "    | "     | 10       |
| 62  | "                     | "    | "     | "    | "     | 10       |
| 63  | "                     | "    | "     | "    | "     | 10       |
| 64  | "                     | "    | "     | "    | "     | 10       |
| 65  | "                     | "    | "     | "    | "     | 10       |
| 66  | "                     | "    | "     | "    | "     | 10       |
| 67  | "                     | "    | "     | "    | "     | 10       |
| 68  | "                     | "    | "     | "    | "     | 10       |
| 69  | "                     | "    | "     | "    | "     | 10       |
| 70  | "                     | "    | "     | "    | "     | 10       |
| 71  | "                     | "    | "     | "    | "     | 10       |
| 72  | "                     | "    | "     | "    | "     | 10       |
| 73  | "                     | "    | "     | "    | "     | 10       |
| 74  | "                     | "    | "     | "    | "     | 10       |
| 75  | "                     | "    | "     | "    | "     | 10       |
| 76  | "                     | "    | "     | "    | "     | 10       |
| 77  | "                     | "    | "     | "    | "     | 10       |
| 78  | "                     | "    | "     | "    | "     | 10       |
| 79  | "                     | "    | "     | "    | "     | 10       |
| 80  | "                     | "    | "     | "    | "     | 10       |
| 81  | "                     | "    | "     | "    | "     | 10       |
| 82  | "                     | "    | "     | "    | "     | 10       |
| 83  | "                     | "    | "     | "    | "     | 10       |
| 84  | "                     | "    | "     | "    | "     | 10       |
| 85  | "                     | "    | "     | "    | "     | 10       |
| 86  | "                     | "    | "     | "    | "     | 10       |
| 87  | "                     | "    | "     | "    | "     | 10       |
| 88  | "                     | "    | "     | "    | "     | 10       |
| 89  | "                     | "    | "     | "    | "     | 10       |
| 90  | "                     | "    | "     | "    | "     | 10       |
| 91  | "                     | "    | "     | "    | "     | 10       |
| 92  | "                     | "    | "     | "    | "     | 10       |
| 93  | "                     | "    | "     | "    | "     | 10       |
| 94  | "                     | "    | "     | "    | "     | 10       |
| 95  | "                     | "    | "     | "    | "     | 10       |
| 96  | "                     | "    | "     | "    | "     | 10       |
| 97  | "                     | "    | "     | "    | "     | 10       |
| 98  | "                     | "    | "     | "    | "     | 10       |
| 99  | "                     | "    | "     | "    | "     | 10       |
| 100 | "                     | "    | "     | "    | "     | 10       |

Back up with  
exp in 24  
hly

Duplicate of Exp  
# 45A

| #    | DATE        | TIME | Q.  | Temp | Volts | Amperes | Total | Remarks |
|------|-------------|------|-----|------|-------|---------|-------|---------|
| 2    | Bath in     |      |     |      |       |         |       |         |
|      | Aug 16, 20. |      |     |      |       |         |       |         |
| EXP  |             |      |     |      |       |         |       |         |
| 6 PM |             | 1250 | 107 | 9.5  | 10    |         |       |         |
| 7    |             | "    | "   | "    | 10    | 10      |       |         |
| 8    |             | "    | 106 | "    | 10    | 20      |       |         |
| 9    |             | "    | "   | "    | 10    | 30      |       |         |
| 10   |             | "    | 105 | "    | 10    | 40      |       |         |
| 11   |             | "    | "   | "    | 10    | 50      |       |         |
| 12   |             | "    | "   | "    | 10    | 60      |       |         |
| HAM  |             | "    | "   | "    | 10    | 70      |       |         |
| 2    |             | "    | "   | "    | 10    |         |       |         |

15 Sec. in Elect. bleaser  
1 Min. in 8/4

Part in 24 Bldg. back up  
with Copper to see if those  
which appears, or dents.

#1 Data. Ni

Eph 47A

DATE Aug 17-20

| TIME | g    | g   | Volts | Amper | Total |  |
|------|------|-----|-------|-------|-------|--|
| 200  | 1270 | 107 | 9.5   | 9     |       |  |
| 300  | 1270 | 107 | 9.5   | 9     | 18    |  |
| 400  | 1270 | 107 | 9     | 8     | 26    |  |
| 500  | 1270 | 107 | 9     | 8     | 34    |  |
| 600  | 1270 | 107 | 9.5   | 8.5   | 43    |  |
| 700  | 1270 | 107 | 9.5   | 8.5   | 52    |  |
| 800  | 1270 | 107 | 9.5   | 8.5   | 60    |  |
| 9    | "    | 105 | 9     | 8.5   | 69    |  |
| 10   | "    | 107 | 9.5   | 8.5   | 77    |  |
| 11   | "    | "   | "     | 8.5   | 86    |  |
| 12   | "    | "   | "     | 8.5   | 94    |  |
| 1300 | "    | "   | "     | 8.5   | 103   |  |

# 2 Both Ni

Exp 48A

Date Aug 17-20

| Time | Wt   | Gr  | Temp | Volts | amp | Total |
|------|------|-----|------|-------|-----|-------|
| 2.00 | 1270 | 107 | 9.5  | 9     |     | 18    |
| 3.00 | 1270 | 107 | 9.5  | 9     |     | 27    |
| 4.00 | 1270 | 107 | 9    | 9     |     | 36    |
| 5.00 | 1270 | 105 | 9.5  | 9     |     | 45    |
| 6.00 | 1270 | 105 | 9.5  | 9     |     | 54    |
| 7.00 | 1270 | 105 | 9.5  | 9     |     | 63    |
| 8.00 | 1270 | 105 | 9.5  | 9     |     | 72    |
| 9    | 10   | "   | 10.6 | 9.5   | 8.5 | 80    |
| 10   | "    | "   | "    | "     | 8.5 | 91    |
| 11   | "    | "   | "    | "     | 8.5 | 99    |
| 12   | "    | "   | "    | "     | 8.5 | 108   |
| 1 PM | "    | "   | "    | "     |     |       |
| 2    |      |     |      |       |     |       |
| 3    |      |     |      |       |     |       |

Cat

15 sec. in blut. cleaner  
 1 min in 8/4  
 Run to 103 Amps,  
 transfer to #24 Bldg. to  
 back up with Copper.

face of ni was brushed with  
 hand brush before entering cell

#1 Bath Ni

Egg #43A

Started Aug 18-20

| Time | Sp. gr. | Temp | Volt | amp | Total |
|------|---------|------|------|-----|-------|
| 2.00 | 1290    | 105  | 91   | 9.5 | 9     |
| 3.00 | 1290    | "    | "    | 9.5 | 18    |
| 4.00 | "       | "    | "    | 9   | 27    |
| 5.00 | "       | "    | "    | 9   | 37    |
| 6.00 | "       | 108  | 9.5  | 9.5 | 46    |
| 7.00 | "       | 109  | "    | 9.5 | 55    |
| 8.00 | "       | "    | 9    | 8.5 | 63    |
| 9    | 1280    | 107  | 9    | 8   | 71    |
| 10   | "       | "    | 9    | 8   | 79    |
| 11   | "       | "    | "    | 8   | 87    |
| 12   | "       | 105  | "    | 8   | 95    |
| 1    | "       | "    | "    | 8   | 103   |
| 2    | "       | "    | "    | 8   |       |

Out

*Duplicate of #44#*

#2 Bath Ni

Started Aug 18-26

Exp #447

| Time | Spqk | Temp | Volt | amp | Total |
|------|------|------|------|-----|-------|
| 2.00 | 1290 | 105  | 9    | 9.5 | 9     |
| 3.00 | "    | "    | "    | 9.5 | 19    |
| 4.00 | "    | "    | "    | 9.5 | 28    |
| 5.00 | "    | "    | "    | 9.5 | 38    |
| 6.00 | "    | 108  | 9.5  | 9.5 | 47    |
| 7.00 | "    | "    | "    | 9.5 | 56    |
| 8.00 | "    | "    | "    | 9   | 65    |
| 9    | 1280 | 106  | 9    | 9   | 74    |
| 10   | "    | "    | "    | 9   | 83    |
| 11   | "    | "    | "    | 9   | 92    |
| 12   | "    | "    | "    | 9   | 101   |
| 1PM  | "    | 105  | "    | 9   | 110   |
| 2    | "    | "    | "    | 9   |       |

*Out*

#1 Bath

Sent Aug. 19, 20.

Mr. Edison's topper face  
Master's Males

Eff. # 497

Telegraphed message

| Time  | Secs | Volts | Amps  | Total |
|-------|------|-------|-------|-------|
| 11:00 | 1    | 105   | 9     | 4     |
| 12    | 1    |       | "     | 8     |
| 13    | 1    |       | "     | 12    |
| 14    | 1    |       | "     | 16    |
| 15    | 1    |       | 8 1/2 | 24    |
| 16    | 1    |       | 8.5   | 33    |
| 17    | 1    |       | 8.5   | 41    |
| 18    | 1    |       | 8.5   | 50    |
| 19    | 1    |       | 8     | 58    |
| 20    | 1    |       | 8     | 66    |
| 21    | 1    |       | 8     | 72    |

Polish twice  
Wash + Brush  
Rinse 15 sec.  
8 1/4 till deep  
red, wash  
Then put in  
in bath 4 amp.  
for 4 hours.  
Theng to full  
ampere.  
Out

Remove from in  
bath + put in  
in at 4 amp.  
for 3 hours  
then full amount  
on, not above  
17 amp. for  
52 hours.

[ITEM(S) FOUND IN BOOK]

[C. J. W. 12, 14602]

~~Put~~ Ni 191 amp hours -  
Washed - rinsed & distilled  
water dried on roller -  
put in with ~~bars~~ full  
Current on —

Subsequent of #2 in bath  
put in #7th Bath

Next in the same as  
above except put in wet

Total amp hours - 171

# 8 Bath

July 14 -

Next 2 Nicks are to be put in  
One with full Current on dry  
The other full Current on but put in wet  
with full Current on

When put into Copper Bath both are  
to go in dry with full Current on



[ITEM(S) FOUND IN BOOK]

# #1 Bath in Plate

11-PM July 14, 20

His face dried.  
Cleaned with lime  
Wash in whirler, rinse distilled  
water.

Put in Electric Cleaner 20 second  
Wash in whirler, rinse distilled  
water.

Put in S-4 20 seconds  
Wash in whirler, rinse distilled  
water.

Put in Ni Bath dry,  
full current on

Noticed blisters about 20  
minutes after running in  
Ni bath.

Taken out 1/2 hour  
after started, to try a new set.  
second set put in at 12-PM.

# #2 Bath in Plate,

11-PM. July 14, 20.

His face dried.  
Cleaned with lime.  
Washed in whirler, rinse distilled  
water.

Put in Electric Cleaner 20 seconds.  
Wash in whirler, rinse distilled water.  
Put in S-4 20 seconds  
Wash in whirler, rinse distilled  
water.

Put in Ni Bath wet  
full current on

Noticed blisters about 20 minutes  
after running in Ni Bath.

Taken out 1/2 hour after  
started, to try a new set.  
Second set put in at 12-PM.

[ITEM(S) FOUND IN BOOK]

Ni face disc.  
Electric cleaner 30 seconds  
8.4 - 1 Minute  
Put in Ni bath dry, full concn.

[ITEM(S) FOUND IN BOOK]

#1  
July, 15, 20

Of the 2 Nickels now  
plating put in both dry  
in Copper bath.  
With full Current.

Don't hesitate when 2 dgs.  
go in or you will burn them  
but put in too quick  
as it will carry air bubbles  
down.

#1 in Bath to #7 Copper Bath  
2 " " #8 " "

~~Put in #7~~ Green  
Pins.

#1 Bath in dry July, 15, 20  
When #2 " wet  
present Nickels

Come out - put in two  
more - run 2 minutes  
then put Current on

After running 30 minutes  
Open circuit for 20  
minutes to let both run  
without Current -  
Then Close circuit &  
let run 45. or more  
amp -

(What about copper baths  
Bath in Copper dry cell

[ITEM(S) FOUND IN BOOK]

~~One~~

July, 15, 20

Bath treated  $\frac{1}{2}$  min  
in Cleaner

1 minute each in 8/4

Clean, rinse, dry one <sup>20 AMP</sup> #1200

+ put other in wet <sup>20 AMP</sup> #2 Bet

1 Minute each without  
Current on then full  
Current ~

5

[ITEM(S) FOUND IN BOOK]

July 16, 20



2 M faced females — <sup>Considerably</sup> Rounded Edges

Put in dry — Let them revolve 2 min then  
put Current on  
Put 75 amperes on —

Wash, rinse dry & put in Copper bath  
with full Current on

Note when Trees start running out from  
the Edges

Put on 800 amp —

Bath above Electrocleaned  
30 sec One minute in 8/4  
Test Copper Res

[ITEM(S) FOUND IN BOOK]

Schedule July 20!  
started with 500 cc H<sub>2</sub>SO<sub>4</sub> 10 A  
500 cc more H<sub>2</sub>SO<sub>4</sub>  
acid in system  
All Coppers  
go in with full  
Current on & WET.  
They can be dried  
if necessary before  
but not put in until  
wet.  
Nickels same -  
Can be dried if  
necessary but put  
in wet  
after 1 Revolution  
Close Switch  
Temp in Copper Bath 117.0 @ 8.00

[ITEM(S) FOUND IN BOOK]

Aug. 16, 20

2 Discards The Varnish removed  
by Benzol, dried & Rubbed with fine oil  
Polished on Machine —

Washed in washer & brushed  
with standard brush (Brady has it)  
Then rinsed distilled water

Cleaned 15 seconds —

Washed, rinsed, then 1 minute  
in 8/4, washed, rinsed, put  
in bath wet. 1 Rev & then  
Current put on — 70 amp  
hours & stripped,

Be Careful in stripping not  
to mar the Edge —

Have C examine under  
microscope

Entered in book Exp 45 H.  
46 H.

[ITEM(S) FOUND IN BOOK]

Aug 19, 20  
Telegraph Record Mallet

Polish Twice over - wash  
in brush,

Clean 15 - wash then in 8/4  
till deep red, wash -

Then put in Nickel bath  
4 ampers for 4 hours

Then go to full ampers

Removes from Ni bath  
and put in Copper bath  
at 4 amp for 3 hours

then full current on rat  
above 14 amp & plate 52 hours



[ITEM(S) FOUND IN BOOK]

#1

6 Revolutions  
in coffin

Copper disc 8/4 —

For Rem

Then ~~PA~~ amp hours

Then Wash & whet dry  
& put in Copper Bath —  
for 600 amp hours —

Then I will peel it if  
feasible

No 2

mt. Rem. in the bath

**Notebook Series -- Notebooks by Edison and Other Experimenters  
Disc Plating Experiments  
Notebook, N-20-08-18.2**

This notebook was used by Edison during August-September 1920. The entries pertain to the plating processes involved in the manufacture of disc records. The notes describe efforts to improve the surface of disc record molds by polishing the copper masters with a rouge mixture and the nickel-faced females with an emery paste. The entries also report attempts to improve the plating by changing the acid and copper sulfate content, by improving the filtering operation, by adjusting the plating schedule, and by applying a coat of rubber solution to the back of the mold to prevent copper and nickel deposits. Inserted into the book is a note from Paul B. Kasakove to Edison describing a mold plated with a copper shot anode. The cover is labeled "T-A-E No 4 Plating Disc." The pages are unnumbered. Approximately 75 pages have been used.

E-2458

N200818.2

Aug 18/20

Our little Cu bath had 140 grms  
Blue Vitrol to liter. 34 gals, 9 acid  
stripping dipped in  
 $1\frac{1}{4}$  for 30 sec. gives dark burnt  
deposit. We then put in  
26 lbs of Blue Vitrol & in  
then stripping  $1\frac{1}{4}$  in  
showed ok Copper except  $3\frac{1}{16}$   
strip at extreme Edge which  
was dark burned. We  
Electro cleaned the stripping  
previously. - acid unchanged  
appears  $\frac{1}{16}$  red. thin in bright area

We now will add Ten lbs  
more Blue Vitrol which  
will I calculate bring  
Cu<sup>2+</sup> up around 285  
grms per liter. 310 grms  
calculated in water at  
ordinary temperatures

Aug 18/20

The Cyanide process used by Dempsey for determining Copper is not adapted to testing our bath, when Nickel is in solution, as any Nickel dissolved functions as Copper @ Counts as Copper & this throws one off as to amount of actual Copper in solution.

The big solutions are not high in Ni yet. But our Expand bath, have to our great surprise more Ni than Copper.

Dougherty is to introduce a different test determining actual Copper content & Nickel as well as Iron & we will not get off again — Our inspections of moulds have reached a very high figure.

Mostly due to gas dents in Ni  
plating & in Copper backing  
the Copper don't weld to  
Ni - always 25% fail to  
Weld + always on sides  
the disc is put in -  
Probably burns edge &  
deposits red sponge + subsequent  
Copper shrinks away as burnt  
Copper don't adhere

Our Cu bath before we  
put in the more CuSO<sub>4</sub>  
had 34 gals. 10% put  
in 36 lbs of CuSO<sub>4</sub>

Old assay

|                                     |                      |
|-------------------------------------|----------------------|
| H <sub>2</sub> SO <sub>4</sub>      | 9.03 grams per liter |
| CuSO <sub>4</sub> 5H <sub>2</sub> O | 142.79               |
| NiSO <sub>4</sub> 7H <sub>2</sub> O | 176.53               |
| H <sub>2</sub> O                    | 3.43                 |

this chry of acid in #24  
may be one of the reasons  
of heavy discharge of self cleaning  
acid is a good cleaner

Aug 18/20

Doughtery tells me that  
the old formula for  
Copper baths should be  
this

Spec 9 about 1.170-

Free  $H_2SO_4$  25 grams liter

Blue Vitrol - 200 " "

(his advice they have a little more Cu than necessary  
but very rich of acid)

Our little bath since I added  
36 lbs Blue Vitrol

Will probably have

270 to 285 ppm Blue Vit

per liter + 22 grams  $H_2SO_4$  free

per liter, +  $\frac{1145}{100}$  grams per

liter of No 504

Doughtery advises  
that as the nickel in

Our big bath rises above  
a predetermined point that  
we remove say  $\frac{1}{3}$  of sol  
Boil down & crystallize  
out the  $\text{CuSO}_4$  & use for  
making new solution  
& the  $\text{NiSO}_4$  purified by  
 $\text{Ni(OH)}_2$  at Lake -

Today - Big bath assay  
# 22A Spec G 1.172.  $\text{H}_2\text{SO}_4$   
1859 grms per liter  
223 " "  $\text{CuSO}_4$

22B -  
Spec G 1.162,  $\text{H}_2\text{SO}_4$  1377 grms per liter  
 $\text{CuSO}_4$  - 216 grms per liter

# 24 Spec G 1.161 -  $\text{H}_2\text{SO}_4$  1269  
grms per liter.  
213 grms per liter  $\text{CuSO}_4$

Our Ni filter press. Elton  
changed cloths every 24 hours  
The cloth is the finest that is  
used in filter presses & you  
can hold it up to the light  
& see its nothing but a  
sieve & only does good  
filtering when fully covered  
with the dark slimy mud  
but before could accumulate  
enough it lost its filtering  
power. yet we had 50 lbs  
pressure on. Moore investigated  
& found that the rubber ferrules  
were all out of line that  
cloths never put in straight  
& the pressure closed the  
water channels the rubber  
ferrules ~~not~~ deformed not  
being in line & closed up  
so liquid didn't get to  
cloths etc -

Moore went over to see  
showers expert, & get  
information & check



lettering cloth, also  
lined up the female inlet.  
Disassembled the cloth &  
now instead of pressure  
rising to 50 lbs in 24  
hours, its gone 24 hours  
& pressure is only 12  
lbs -

He with put in new cloth  
double as thick as cloth  
now used, new ferrules  
lined up, & fix the holes in  
checkerboard so cloth  
cant close them & try -

Shivers man says better  
cloths should be boiled  
in water 2 or 3 hours -  
Cool off - Cut water  
put in - & when removed  
from press cleaned &  
boiled again for short  
time & put in wet (ie)  
moist, & sand cloth

L. Vinson

Night Asst Supt

Plating Plant

Shoved last several months  
+ stands  $\frac{1}{4}$  to  $\frac{1}{2}$ " of mud -

Copper backing

Have just discovered cause of

series dents - its due to high

density making gas bubbles

in cleaner or in Copper backing

The gas insulates the Ni

+ the edge has great density  
and builds up red cross

Note

Aug 19/20

All experiments with edge of disc  $1\frac{1}{4}$  inch in liquid bath Cu & Ni - ~~not~~ put in bath with. Current on full show burning bad with low Copper in sol. It improves very much with very high Cu Content, still more with acid 20 grams to liter -

Our Exptl Sol is loaded with  $\text{NiSO}_4$  - Reg lks solution has been stronger than ours

With 4 amp. a record not cleaned shows if only in 2 or 3 minutes that  $\frac{1}{2}$  of the whole surface is not plated over. The music grooves at bottom not plated at all where ball goes. No finger marks deposited on it takes a long time 10 min before the stains & dirty parts cover, Hence we really

Note

at first have a plating  
area only  $\frac{1}{2}$  to  $\frac{2}{3}$  of what  
we thought we had hence  
the closing of the full  
Current on such a reduced  
surface & also to fact  
that the Edge has 50%  
more current go to it  
than any other parts  
gas is formed also dirt  
nuclei has an edge all around  
it & the Edge has high  
density, hence brods  
dents Ejectors from dirt  
nuclei & gas & stripped  
face due to burning  
& formation on red porous  
surface,

By plating at a low  
density of 4 amp  
no burning of gas made  
the Edge around dirt nuclei  
has very low density  
& forms no Craters to

Produce Cavities -  
So that in 2 or 3 hours  
we have 001. Wick of  
plating not burned & no  
gas + chemically clean  
then when we put full  
16 amps on no change  
of disc is noticed on exit  
from liquid in rotating

We are going to put Res  
Coils on amp meter side  
of Swirlah - & abandon  
reading with 1 amp  
meter. We propose  
polishing the female  
by once over in polisher  
clean in Water jet cleaner  
with brush. Once distilled  
water. Then Electro cleaner  
15 sec. 8/4 - for 30 seconds

Wash, rinse distilled  
Put in bath wet, rotate  
3 or 4 revolutions to  
permit acid to dissolve  
any oxide then close  
coil switch which is  
adjusted to 4 amperes  
Leave on 3 hours -

This gives 12 amp hours  
& deposits .001 sheet,  
Then ~~close~~ throw  
switch over to full  
Current say 16 or 17  
amperes to Run for say  
50 hours -

note

S

1

Aug 19/20

At last we know why trees  
grew on the edge of our  
masses in experimental  
lab since  $3/4$  in in middle &  
 $1/2$  at edges. While previously  
none grew from discs in  
Bog like bath.

It was due to the fact  
we had only 142 gms of  
CuSO<sub>4</sub> to the liter.

While works has 220 to  
245. They also had 15  
gms H<sub>2</sub>SO<sub>4</sub> & we only  
9 -

When we  
added 36 lbs of CuSO<sub>4</sub>  
& 300 cc acid we went  
higher in CuSO<sub>4</sub> than  
works probably 290  
gms per liter & perhaps  
18 gms. acid.

After this our discs no  
longer grow trees & act  
like works, after 26  
hours plating is fine.

Notwithstanding we have  
176 gms of Ni to dist  
in addition

Make some Res coils for  
4 amps on  $9\frac{1}{2}$  V for  
Copper baths. 39 of them  
will start all backing  
of Ni moulds with  
3 Hours at 4 amp then  
full current for 50 Hours

Will also get coils for  
3 ohms for Nickel  
baths & plate 3 hours -  
then throw over to full  
current. With 39 Nickels  
& 98 or one Cu table  
we can determine value  
of this process



Aug 19/20

Noticed a female <sup>nipped</sup> put in  
Current Opair - 3 Revolutions  
made a stitched closed  
with 4 amp coil -  
That it required 7 minutes  
for the tint to even up  
so uniformly coated -

We will try putting  
another <sup>in</sup> with the  
4 amp on see how  
long it takes,

Also another like the  
first but with brush it  
~~will~~ see if after  
taking out of Ni bath  
washing, if benching  
does good, ~~at all~~

We find that putting in  
4 amp with Current on  
didn't clear up in  
minutes, but the difference  
in tint was marked the  
one put in without Current  
~~for~~ 3 rotations & then put  
Current on showed a bright  
Copper tint on half &  
the other dark tint  
disappearing in 7  
mins

Whereas the one put  
in with Current on  
showed a bright tint &  
other half a Red tint  
& didn't disappear  
for 7 minutes & now  
after 20 minutes the  
2 tints are distinct

~~From this we~~  
Conclude that  
pulling in with  
Current on is Not <sup>good</sup>

Note

We put another in  
without current on  
but brushed —  
This acted no better  
than the one put in  
without current &  
not brushed — 4 amp

We will now put one  
in which is electrically  
cleaned with current  
off — 4 amp.

Note — The tech matrix  
they said they couldn't get  
a good sample. I put it  
in nickel 3 amp after  
cleaning 15 sec. ~~15~~ 5/16 till  
it got red — Then transferd  
to our air bath 4 amp.  
put in current off after  
a Revolution put current  
on — 3 hours, then

20

Put full Current on  
but it showed no tint  
as it came out "  
Showing the same as  
another disc did the  
same way 3 hours 4 amp full  
Current until Total 72 amp. "  
Tinting of  $\frac{1}{2}$  the record  
is due to oxidation stains  
8/4 film. etc - but once  
the covered by chemically  
clean Metal increasing  
the Current 4 times  
shows no change

Notice 2 females put  
into the bath 4 amp -  
That in No 1 was bright  
when put in & quickly  
covered. That in No 2  
was tinted by solution  
& other irregular causes  
dark



but after  $\frac{1}{2}$  hour you  
can still notice the  
dark tinted spots in  
places -

This should warn us  
to clean our working  
fluids when they are  
treated by running them  
over the Polishing  
Machine at least  
once over & if very  
bad twice over. Using  
30 sec  $\frac{3}{4}$  But never  
using electro washer  
more than 15 sec.  
& Brushing in water  
jets. Care being taken  
that sp. should be  
1 minute strength  
to the test Copper

The stain x is due to



Some kind of oil leaking  
on a filter probably

Copper & the acid attacks  
the nickel corroding it  
the dark tint being corrosion  
shadows. I have noticed  
this corrosion on many  
moulds, spots or rather  
streaks in mirror ~~look~~ <sup>grain</sup>  
looked like dirt plated in  
water shown when light  
was right that there was  
no space of dirt but it  
was corroded & when  
light right showed all  
metal. Originally it  
may have been dirt &  
it had fallen out.

Aug 20/20

One of Cullen discards  
which he put in bath  
& hesitated, shows a  
big blister,  $1\frac{1}{2}$  area —  
two dents were on the  
surface. These on Ni  
stripped showed traces  
of copper tint.

The stripped copper  
surface was clean &  
cut blister out & found the  
dents. Somehow the  
blister was raised up  
but the 2 spots producing  
dents stuck & then peeled  
Ni down while open  
pressures acted to strip  
the Ni from the copper.  
The pressures must have  
been very high to stretch  
this out off nickel. This  
spot was easy stripping.

Whereas all adjacent areas  
was clinched. Gas probably  
leaked into this area  
from one of the dents.

Took a discard nickel faced  
female.

Put on polisher & went over  
it with Emery & brush on  
machine

||||| - Examined. No wear

I start on another 10  
times over.

||||| - This makes 20  
times over = No wear is  
perceptible so far -

||||| This makes 30 times over.  
I cannot detect any wear  
of big waves or any where  
no scratches -

||||| This makes 40 times  
no wear detectable -



NOTE

UK UK 50 times over with  
SFXXX Washington State  
Every one wear - no wear at all

I will now treat the  
Mould which has been  
polished 50 Times -  
shows no signs of wear  
with 8/4 direct for 1 minute  
without wearing shoes  
then polish the ear  
how many 8/4 treatments  
I can go at 1 men strength  
for Copper & grind the  
surface off to rate wear

MISTAKE

All these Exercises  
with grinding session  
is with a female

III III 50 times over by  
flour Emery & Tooth Brush

All these results are  
with a female

& this would show  
wear like a Male

I will now polish  
a MALE & see  
how many times  
it goes without  
being flat Top -

I now polish a  
working Mould - Male

III III 10 times. Can't see  
wear except.

Chatter Marks

show still but have

Disappeared from the  
top, but some had worn  
off making records as  
this is a working model  
off pressure -

26th  
On 20<sup>th</sup> Aug 348 Doses  
removed from Baths  
of which only 10 were  
discarded in the Control  
room which is abnormally  
high. These went in  
24 days previous or say  
54 hours -

About the time they were  
put in we brought acidity  
of bath up, for we launch  
#24 was lost from 12,30  
grams acid to 16 about.

Also we had better falling  
in 24 -

Also Added very much  
more Acetic in Nickel

Also now better falling of Ni sol  
+ Cu sol in 24 -

Aug 21/20

Complete test by Dougherty  
of the Copape Solutions  
in 22A + B + 24

|  |        |        |        |
|--|--------|--------|--------|
|  | 22A    | 22B    | 24     |
| Speed  | 1.175  | 1.174  | 1.167  |
| first H <sub>2</sub> O <sub>2</sub><br>growing<br>solution | 14.44  | 17.59  | 14.57  |
| Blue Vitrol  | 231.31 | 227.32 | 218.58 |
| NiSO <sub>4</sub> tag                                      | 16.75  | 27.38  | 17.87  |
| $\frac{1}{2}$  | 0.713  | 0.824  | 0.646  |

Dempsey is adding acid slowly.  
When he started it would  
not went in after the addition  
of 1st lot had low repetitions  
2 1/2% in Control room 328  
taken out previously # 24  
only had 12 acid.

The reason disc come better  
when acid increased say in  
#24 from 12.47 gms per  
liter to 22.58 gms per  
liter is due to the stronger  
acids cleaning power on  
the disc when first put in  
also in a measure to better  
conductivity & greater  
efficiency of the anode.

25 gms free  $H_2SO_4$   
is the standard but  
owing to a poor test method  
it had fallen to 12 1/2 gms  
& descends got very  
high - 18.6 but it to 19  
which is much improved  
The OK discs in Control  
room a probably in  
Xathie & press room from  
which it is most used.  
Reports -

*[Signature]*

Aug 23-20 See last page

Dempsey has added more  
free  $H_2SO_4$   
Baths now tests by new  
method of testing

|            |       |
|------------|-------|
| #24 Spec 9 | 1.170 |
| 22A "      | 1.180 |
| 22B "      | 1.180 |

|                    |       |       |
|--------------------|-------|-------|
| #24 Free $H_2SO_4$ | 22.58 |       |
| 22A "              | 20.95 | 25.00 |
| 22B "              | 20.75 |       |

|           |        |
|-----------|--------|
| 24 Cub 04 | 229.29 |
| 22A       | 236.96 |
| 22B       | 234.92 |

Disc coming good in  
Control room -

25 gms  $H_2SO_4$  free  
acid in Cu baths  
is standard

*[Signature]*

23 Aug/20

I have noticed several times  
that moulds which have  
flat tops on all the  
music waves & produce  
records which are very  
bad & should never be  
shipped that the flat  
tops are all mottled



Bright +  
Mottled -

May be due  
to spongy  
Ni - To  
The Chloride  
to which  
record being  
pressed against  
something hard  
in the room or

The mould making the record  
was running & (low)

it pulled off - It shows  
very bad flat tops as well  
as the sections from it -

I will polish & see if  
it helps & also make a  
test record -

Aug 24/20

Kasacova has 5 men in  
his dept & will take on one  
more from Mike Costa  
who he has been using

E Mooney

Tocondru

V Mesa

"

J Grass

"

M Camposi

Arado, decon

S Cogza

"

He has made Expts & find  
with cloth separation &  
Maple has depts no  
practical difference in cleavage

He is changing over to  
Maple as fast as he gets  
them —

Aug 24/20

Present Schedule on  
Pressures

2: on Contact - 90 lb  
pressure -

10 minutes on high at  
850 lbs pressure

1st temp 180°

Last temp - due to

steam at pressure

presumably 125 lbs



We take 50 of first mould  
out of bath that reach  
Control room & follow them  
to Press Room to get  
OK moulds -

Aug 20th 20

Control -

Laths.

"

Presses

None

1 Bunched

2 Loose M

5 Small Laths

1 Bunched

1 " " " " " "

10

80% OK -

Aug 21

Control

Laths

"

Presses

"

2 Bunched

3 Lost moulds

2 Loose M

1 Small Laths

5 Lost moulds

1 Bunched

14

72% - 74% OK

Wife

August 22

|                |                  |
|----------------|------------------|
| <u>Control</u> | 2 Bent,          |
| Lathe          | 2 Broken Cuts    |
|                | 1 Loose Ni       |
|                | 3 Group Bent     |
| Presses        | 5 " "            |
| "              | 1 Pitted - rough |
|                | <u>14</u>        |

72% - 80% Plating

Aug 23

|                |               |
|----------------|---------------|
| <u>Control</u> | 3 dent        |
| +              | 3 scratched   |
| Lathe          | 2 Broken Cuts |
| "              | 2 Pitted      |
| Presses        | 2 Group Bent  |
|                | <u>12</u>     |

76% 86% plating -

Aug 24<sup>th</sup>/20

Control

none

press-

- 7 Broken Cuckoo
- 2 Dents
- 1 Porous
- 1 Bunkle

Presses

- 2 group Dents
- 13

74% OK

88% Flaking

Aug 25/20

Control

0

Labels

- 2 Cut thru label
- 1 Copper Smith's
- 1 P. H. H.

Presses

- 2 Ranges plating - P. H. H.
- 6 group Dents
- 1 Dent + Scratch
- 1 Neckers, end wing

72% OK

90% flaking

Aug 25/20

326 Moulds today only

2 Discards 1 a scratch  
1 a Dent

26th - 50 Moulds

|         |              |
|---------|--------------|
| Control | None         |
| Laths   | 3 Bent       |
| Press   | 4 group Bent |
|         | 1 Pitted     |

84.6% OK

27 - 50 Records

|         |                  |
|---------|------------------|
| Control | None             |
| Laths   | 2 broken Centers |
|         | 1 plating defect |
| Press   | 4 group Bent     |
|         | 1 Pitted         |
|         | 1 Buckles        |
|         | 1 Rough plating  |
|         | 1 Buckled        |

10 all told - 80%  
 86%  
 Done plating

28 Aug - 50 Moulds

|         |  |
|---------|--|
| Control | None   |
| Laths   | 1 Broken Center<br>1 plating dent<br>1 torn label<br>1 Burned Copper |
| Press   | 1 Service dent   |

84% OK all  
 90% OK plating

Aug 31

|         |                  |
|---------|------------------|
| Control | None             |
| Laths   | 1 Bent           |
| Press   | 2 - Service Bent |
|         | 3                |

94% OK

To this point 78.8% of all OK  
 85.2% plating only

*Walt*

Aug 26/20

In screening out old shot  
Ni Anode stuff thru 10 mesh  
That is to be used again  
The old + new mixed should  
either be well washed  
to get rid of clinging black  
hydroxide, or the bath  
should be filled nearly to  
overflow & allowed to  
settle before jet is turned  
on. Otherwise there will  
be lots of float which  
may get on discs & also  
muck up filter cloth

Aug 26/20  
Copper Bath

|      | Sg    | H <sub>2</sub> SO <sub>4</sub> | CuSO <sub>4</sub> |
|------|-------|--------------------------------|-------------------|
| 22A. | 1.180 | 21.09                          | 237.47            |
| 22B  | 1.180 | 21.22                          | 235.94            |
| 24   | 1.180 | 22.45                          | 220.11            |

Aug 27

|     | Sg    | H <sub>2</sub> SO <sub>4</sub> | Blue Vit |
|-----|-------|--------------------------------|----------|
| 22A | 1.183 | 22.46                          | 234.70   |
| 22B | 1.179 | 21.22                          | 223.67   |
| 24- | 1.183 | 23.80                          | 244.40   |

Aug 27/20

Think we have a good  
Rubber Dope for backing  
moulds which is non  
inflammable Rubber  
dissolves pretty well  
in Carbon Tetrachloride  
will give it a good  
trial

Polished with  
Ranger glycerine in  
Copper Masher it  
does it pretty good  
without material after  
reducing Chatter marks  
only on tips of largest  
incubation & then  
can still see after  
tine over. Think  
can polish 5 or 6  
times which should  
give 18 <sup>to 20</sup> finish -  
probably over over  
after 3rd run enough

I will also try SF 12 X  
which is much finer  
than SF XXX over  
regular Emery

Note - We cut in two  
Req wood handle tooth  
brush & make 2 polishing  
brushes -

### Polishing Machine

1 in Control 1 shift  
2 in Lathe 1 shift  
once over -

2 Machine Press  
dept 3 shifts -

Total 6 Machine

Possibly 1 in  
Master room -  
We will use sample one  
to start -



Echos are not lost in  
When phone is 1" out  
level either way —

Curious - Caldwell & Neil  
picked out 10 Records  
without starting Echos &  
10 with them —

I found all had the  
Echo - With rough start  
on Machine their Ear  
accommodation rendered  
Ears insensitive while with  
Duraath starts the  
accommodation muscles  
didn't work & their Ears  
were sensitive & could  
hear Echos

But my accomdin muscles  
are gone & I hear Echos  
on rough start

Aug 27/1920

Dr. Snodol for wiping moulds

1<sup>st</sup> Solution. 500 grms CP Sulchloride  
to One Gallon Alcohol

2<sup>nd</sup> Solution -

4 <sup>50</sup> grms of the Above to  
One gal Alcohol. the latter  
is the solution used

To be corrected later

Thermometers for use  
throughout factory  
where temp to be  
measured don't

212° Fahr should be

Alcohol colored Red

+ flat broad stream of red

These can be read

Easily from a distance

in dim light.

The type is to 6738

in Emeralds Catalogue

80 cents but even so

got cheaper

Today Mac lost in a  
female & Male described  
today. The Male for  
dentist;



3 of them like this —

Nothing could be run on  
female — There were  
3 dents in a row



These dents were made by  
3 separate rotten wood  
fibers floating in bath  
& attaching to female  
causing injury to placenta  
on female.

Aug 27/20

Experiments on ~~and~~ start repeat  
and read after Echo

Tried Reg schedule still in  
" old schedule - to cut  
Contact 2 min 300 lbs  
2 min, then 800 lbs  
12 minutes still in  
both Echo before going  
Tried Reg schedule +  
took it out hot about  
160° fahr - still both  
in

over

1  
tried Reg schedule now in  
Vague but with 600 lbs  
signal pressure instead  
of 800 - still in but no  
so prominent

The Mould we are  
using is very bad.

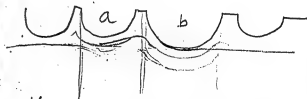
Halloo-

yet this was a full blown  
good print - its interesting  
it didnt make a poor  
print -

Regular Schedule but  
only 400 lbs of final  
pressure -

Bad print as expected  
but I can swear I get  
the Echo - while in  
Reg record its loud &  
distinct

Possibly



flows under & rises under  
adjacent grooves. before  
it reaches face of blank  
when b reaches bottom  
a is above & this flow  
from b must pack it tighter  
hence pressure on a  
is above normal due to  
flow of blank from b  
this difference in  
density causes a spring  
up in a when pressure  
is relieved on blank

Used that 3 times over polestar  
at very dark working would  
good ~~it~~ with finer Eucery than  
SF XXX which we are  
using +

The very fine is SF 12 X  
It's the only size that should  
be used on Ck paper

Send for 20 pounds

Look Reports of 273 Record  
pages by Caldwell -  
Burgund + Neil

31% had Echoes + Repeats,  
Consisting of 14 Echoes  
80 Repeats, true Echoes

Many were Dupes Records  
Covered 40 faces of days.

All thin those that were  
OK shows no repeats  
those which had repeats  
always had repeats

Aug 28/20

There is no longer any doubt  
that the wiping upstair  
produces flat tops and  
that polishing increases  
the loudness, but the Volume  
even after polishing is  
very noticeably less than  
when new. I cannot say  
if it is due to the ~~loss~~ angle  
or not. Or due to movement  
of the hard blank on the taps  
of matrix wares.  
I am inclined to think this  
is cause, or movement of  
moved on hard blank  
several hundred times.

A trial of rubbing a  
matrix (surface) with  
edge of a record & closely  
shows it. flattening,  
when light is not pressed  
only flattens higher  
waves.



Moore tells me that  
large number moulds  
haunt the springs on  
to keep the clouds off  
the blanks -

Indeed in one way would  
that a small low wave  
~~was~~ between 2 high waves  
was flat under means  
while the 2 large or high  
waves showed not flat.  
This is very strange &  
difficult to explain of  
tops are flattened by  
wiping - except that  
subl is popped into the  
hollow & eats or eats  
metal

4000 says exp. only  
of carb. still C for 11.11.11  
water is  $7\frac{1}{2}$  gal hour  
& storage capacity 250  
gallons

Aug 30 1920

I find it a general practice  
that when rubber hose is  
connected to a pipe only  
one turn of Copper wire  
is made hence we have  
many disastrous results  
loss of electrolyte

The Minimum turns  
should be 34 where  
it can be done 5 to  
7 turns should be  
made —

Found Hoffman men  
were using alcohol  
with  $\text{SnCl}_2$  19 grams

$\text{SnCl}_2$  to Gal —

Makes 2000 parts  
he is now to make it  
2 grams per gal  $\text{SnCl}_2$   
do this with very  $\text{SnCl}_2$

Note.

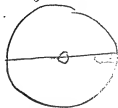
Aug 30 1920

for last 6 weeks we have averaged  
Each day put in 6 hrs

|            |                 |
|------------|-----------------|
| 10         | Masters         |
| 22         | Master females  |
| 68         | 2nd Masters     |
| <u>276</u> | Working females |

## NOTE

Arches found 2 repeated  
discs which showed blisters  
These showed marks plain  
that belt had slipped  
These blisters were at  
the Edge just inner



(blisters)

Both discs same  
Will show all blisters repeat  
+ follow this up

Sept 1, 20.

Note =

9 am. Baths were

| Spec | g     | H <sub>2</sub> SO <sub>4</sub> | B. Vitrol |
|------|-------|--------------------------------|-----------|
| 22A  | 1.185 | 22.32cc                        | 232.57    |
| 22B  | 1.190 | 22.03 "                        | 226.92    |
| 22C  | 1.190 | 23.36c                         | 227.43    |

Preliminary

| Spec  | g     | H <sub>2</sub> SO <sub>4</sub> | Blue Vitrol |
|-------|-------|--------------------------------|-------------|
| Water | 1.155 | 23.24                          | 207.92      |
| 22W1  | 1.155 | 24.34                          | 201.25      |
| 22W2  | 1.150 | 24.80                          | 201.22      |

Mouth eggs over

Copper Electrolyte had

17.47 grams Nickel to 1 liter

Sept 1-1920 44 years

Fz 1%

Kaia Koru listed for  
Baths -

Lab -

Temp 80°

Speed 12.30

Amps 15

Volt 9.4

Free H<sub>2</sub>SO<sub>4</sub> 11.37

Blue V per lb. 249

---

22.13 -

Temp 86

Sp G 117.5

Amps 15.5

Voltage 6.5

Free H<sub>2</sub>SO<sub>4</sub> 22.13

Blue V per lb. 232.31

Smaller resistance probably  
due to greater amount of water

This shows importance of  
keeping up acid to 25"  
grms per liter & close to it  
to controlling own temperature

Same old story.

Caldwell in Middle room between  
Dally & Moore gets very  
much high % of OK  
records than Neil in  
Music room where it is  
quieter -

Sept 3 / 20  
Latest results.  
Polishing Working  
females, 9 day,  
work - average  
for the 3 disc machine  
5 moulds per hour

Note

Sept 3<sup>rd</sup> <sup>K</sup> Saturday 1920

Gave order to Ramsey  
that starting Wednesday 6<sup>th</sup>  
morning all shifts put  
all models in nickel  
baths 10 hours before  
putting in Copper baths

---

---

Sept 11 1920

Put plate glass 10" square  
in 22A 22B & 24-

|     |    |        |          |        |
|-----|----|--------|----------|--------|
| for | 18 | Milgrm | from 22B | Copper |
| got | 13 | Milgrm | from 22B | Nickel |
|     | 27 | "      | "        | 24     |
|     | 57 | "      | "        | 22A    |

---

Mr. E. H. Brown

This is a stripping  
from a discarded  
mold put thru  
regular cleaning &  
nickel, and kept  
50 hrs in copper  
bath, using copper  
shot. The copper  
shot was very  
crude being only  
first try at it. East



On Aug 30<sup>th</sup> Took simultaneously  
from all presses. Whole  
load of records 1168 faces  
584 Records -

All were tested by  
Neil & Caldwell finished  
10<sup>th</sup> of Sept.

Neil was in Music room  
Caldwell in 4 bby  
between Dalby & Moss  
room -

Neil's place more quiet  
hence higher rejection  
as expected

Caldwell had 464 faces  
OK + 256 faces fairly good  
39.6% Good 3  
21.9 " fairly Good 3 61.5%

But seconds (taken) only  
gives total 27% or  
47.5% Commercial

Neil went over all of same records -

1170 faces 421 Comel & family  
Commercial Total 35.9%

Records 587 -  
141 Comel & family Comel.  
Total 24 1/2%

Resumes

|          | <u>Faces</u> |
|----------|--------------|
| Caldwell | 61.5% OK     |
| Neil     | 35.9% OK     |

|          | <u>Records</u> |
|----------|----------------|
| Caldwell | 47.5% OK       |
| Neil     | 24 % OK        |

Shows the immense difference between testing in rooms where quiet or noisy -

The greatest difference of all  
is this -

If moulds are printed &  
then runs them on machines  
he will report few good  
surfaces mostly poor  
surfaces - But if they  
have been run over by  
the reproducer once  
& then carefully wiped  
clean he will report  
nearly all good surfaces.

The reason is that in  
grooves where ball  
rides there is always  
a great number of points  
due to unknown reasons  
These lift the ball &  
grooves & sound & at  
same time crush to  
powder. If this is  
wiped out then they  
do not give any sound  
the 2<sup>nd</sup> time over

Everyday we will have  
250 to 300 new working  
moulds making 125 to 150  
Records to supply new  
~~new~~ Times & replace worn  
moulds -

Each one will be assembled  
in a mould if eye inspection  
shows it is not injured -

2 prints are taken on  
Reg blanks -

The first one is not used  
except for reference -

The 2nd mould is run once  
over by girls with approved  
Reproducers

These 2 records go to the  
Mould testing the 2nd  
one is cleaned with  
thoroughness by cloth &  
brushes

It is tested for surface Snaps  
etc according to schedule  
Those not passed as OK  
have to pass to final  
Inspection with Havers scope  
Whole listener decides if  
repairable if so passed  
to Working Master  
Repair dept 2 or 3 men  
will probably be enough  
to Repair them —

The testers of the test  
Record must be in  
very quiet room  
isolated from noise  
of factory, power  
out of the factory  
away from machinery  
etc) The only  
Carrying well over  
300 record one night

We use about 2 lbs  
of metallic Selenium per  
week

Its bought from a Concern  
in N.Y. City - It is  
made by a Baltimore  
Copper Refining Co

It is found in the mud  
after anodes from Copper  
Baths, I think this  
Co is owned by  
the American Refining  
& Smelting Co

We paid at one time  
\$1. per lb lately 24¢  
lb - We have

Sept 13 1920

110 lbs - over a years  
supply - We should  
keep 4 yrs supply

As this Co might give  
up saving it & we would  
want this time to  
get other Cos saving  
it

Sept 14/20  
With only 3 days exposure

it looks as if all Copper Nickel  
Anodes made from these

give in 24 hrs 1500

gals - an increase daily  
of  $6\frac{1}{2}$  grams  $\text{NiSO}_4$   
per liter per day  
390 baths

This is about 100 lbs  
daily of  $\text{NiSO}_4$   
320 g. Melanite to 2800 g. Cu  
Metallic - about right  
Roughly

Anchor Reports about  
about trees etc

22 A Preliminary bath  
"do you want skimmers  
in the Coltrane Chamber  
still retained in bath  
Master room?"

I have noticed about  
80% of cases where trees  
originate. There is no  
skimmers in anode chamber  
but could not positively  
say at this time that  
this is cause of trees

I have noticed when a  
disc is Concave at Center  
after running its full cycle  
of plating, when taken out  
of bath it appears as if  
solution was not up to  
Center when plating

Also that when we



Sept 15/20

have a ~~Condy~~ center that  
more nubs than usual  
appears which will give  
~~a~~ granulated center -

Varnishing backs of  
Records with Regular  
Rubber Dope from  
Comb'n Rub Co -  
Cycle

One coat 30 seconds

Rubber used each

Coat 35 cc

Oven Temp 110° Fahr

20 minutes required for

Drying -

Hence Complete Cycle

3 Coats is  $1\frac{1}{2}$  Minutes

1 Machine Theoretical time  
320.8 Hours Must have 2 shifts

(123)

Tests of Records under  
Varying Conditions of  
noise by Neill & Caldwell  
20 Tunes 10 Records

Sept 15/20

Music Room Ok for surface 60%  
Hall outside Machine shop 80%  
Machine Shop 100  
Testing booths 2nd floor 100%  
showing our Sec tests are Valueless

Sept 21 1920

Selected 4 Tunes for rough  
surface for true echoes  
Very loud echoes & moderate  
Echoes doubling the voice  
all way thru. Tried in  
Office & Drafting Room  
Library - Each man  
noting on paper quality  
of Records

Report on file in office,  
Apparently public don't hear echoes  
& not much of the loud singing  
is so pitifully kind but I know even if they  
don't hear the defects it hurts the  
General Effect without their knowing it

By using glycerine  
glass & dry glass in  
Celluloid dip room  
find lots of filaments  
of silk settled down  
in this 3 days after  
stopped dipping  
also pieces of silk  
also Coal dust from  
Chimney of Captain  
found 100 times larger  
than could go thru  
silk - showing the  
cloth filter has been  
full of holes for months  
has allowed dirt to get  
in it has been  
worse than useless  
& a positive injury  
this shows necessity of  
periodical inspection  
by Genl Office Inspection

Think best condition  
is a filter press 36" frames  
& many frames - lighter  
with this we can clean  
cloths easily be covered  
no leaks, & get enormous  
air filtering surface in  
the very smallest space

## Rubber backing No 1

20 gms gum to 100 cc  
Regular Cornstarch & Co. Dope -  
mixed in mixer well -

2 Coats dried in oven  
at 110° Fahr. Each coat  
dries OK in 30 mins, both  
Coats 1 Hour -

Flowed on rough back of  
Rubber Mould. -

Plated thick - 50 hours  
16½ amp - OK not a  
single nub

A Duplicate shows  
considerable nubs near  
label no nubs 1½ from  
edge - nubs very easy  
come off with finger nail  
Fred says this dip is  
rougher, lots pin points  
if these were roughed  
down it would stop  
nubs

#3 is Dup of 1 & 2  
Except 3 Coats

Only 2 or 3 nubs at label  
to OK.

4 Dup about 6 nubs =  
All these 1 2 3 & 4

are OK for practical  
work, ~~the~~ 2 Coats as good  
as 3 Coats, 2 Coats work  
for those not so rough &  
3 for very rough -

5  
Same as above mix  
but 1 Coat nubs all over  
& quite thick  
Dup - Wonsi

This is 5 grams of Gluonite  
to 100 Rubber Dope  
# 3 Coats not a nub  
on it OK.

Dup - Not a nub - OK.

Fred says there were considerable  
smudges then #1 & 2 needed

Dup of above 2 Coats  
1/2 doz nubs at Label only

Dup - nubs at Label only  
~~to~~

Dup but Only 1 Coat  
Horrible nubs all  
over

Dup - Horrible - H.G.

Sept 22 1920 -

With .093 nozzle the 20 gram  
Gluonite to 100 cc Contain R Col Dope  
puts 14 cc on disc once over  
or one Coat, we will use 2 coats on  
good & 3 coats on Rough backs -

Sept 23/20

Scheme for sticking on  
tissue paper on Matrix to prevent  
injury -

100cc Alcohol

100 grams Resin

10 cc Cotton seed oil

This appears good so far  
but perhaps should be  
6 cc oil,

Weak hot soda solution  
Removes all -

Brushes ~~Phosphorus~~

Wears scarcely any  
Adapted on standard

Red Glass  
Chest

Wheatlon bridge 021 of  
thin - Resistance

1 1/2 oz on each prong

4.5 oz pressure Wear

Very small & its OK  
Beats brass (yellow) glass OK



We are going to put a guard  
Coat over contact springs  
on disc holder to prevent  
men from bending them →

**Notebook Series -- Notebooks by Edison and Other Experimenters  
Group 3: Recorder and Recording Experiments (1914-1924)**

This group of twenty notebooks covers the years 1914-1924; most of the books were used before 1918. The books are arranged into two subgroups. Seven books by Absalom M. Kennedy, covering the period February 1914-September 1915, contain daily records of experimental work with phonograph recorders and reproducers. Kennedy's notes include numerous references to Edison's own involvement in the experiments. Most of the entries relate to Diamond Disc records, but there are also notes on kinetophone and cylinder records.

The second subgroup consists of thirteen loosely related notebooks by Kennedy and other employees of the laboratory and Recording Division, including F. C. Burt, E. Rowland Dawson, Frank H. Losey, Walter H. Miller, and George J. Werner. Many of the experiments involve the use of various types of recorders and horns—as well as variations in the positions of horns, recording machines, instruments, and voices—in order to determine the optimum volume and quality of sound. The entries frequently bear notations by Edison, some of which are extensive. The eight selected books primarily cover the period May 1915-August 1917, but there are also some entries from 1918-1921.

Related notes on recorder and recording experiments can be found in N-15-12-20.2, Notebooks by Edison, and in N-17-02-06.1, Notebooks by Edison and Other Experimenters—Navy and Wartime Research Experiments.

**Notebook Series -- Notebooks by Edison and Other Experimenters  
Recorder and Recording Experiments -- A. M. Kennedy Books**

These seven books by Absalom M. Kennedy cover the period February 1914-November 1915, with one additional entry from May 1916. They contain daily records of experiments with phonograph recorders and reproducers conducted by Edison and various other employees of the laboratory and recording division, including Harry W. Doyle, Clarence B. Hayes, Miller Reese Hutchison, Charles W. Luhr, Walter H. Miller, and George J. Werner. Although most of the experiments involve disc phonographs, there are also some relating to cylinder phonographs. Many of the experiments are intended to determine which recorders and conditions work best for different voices, instruments, and types of music. The tests involve the use of various recording heads, arms, and horns; diaphragms; reflecting screens; and connections (tubing) of horns to machine. In addition, there are variations in instruments, characteristics of instruments (for example, the piano top open or closed), and positions of horns, instruments, and voices. Most of the entries report on the results, such as the quality of the recorded sound, and Kennedy frequently mentions Edison's opinions and suggestions about particular recordings or masters. Some entries describe other work by Kennedy, such as running kinetophone demonstrations and training Diamond Disc salesmen.

All of the books have been selected.

| <u>Book #</u> | <u>N-Number</u> | <u>Labels and Inscriptions on Front Cover</u>                                |
|---------------|-----------------|--|
| -             | 14-02-28.2      | "Recording Experiments"  |
| 1             | 14-09-21        | "Daily Record of Recording Experiments A.M. Kennedy Cement"                  |
| 2             | 15-03-17        | "Recording Experiments Book #2 from March 17-1915 to June 4, 1915 Kennedy"   |
| 3             | 15-06-04.2      | "Recording Experiments Book #3. From June 4, 1915. To Aug. 2, 1915. Kennedy" |
| 4             | 15-08-02.2      | "Recording Experiment Book #4. From Aug. 2 To Sept. 16"                      |
| 5             | 15-09-17        | "Recording Experiments Book #5 From Sept. 17, 1915 To Oct 21, 1915"          |
| 6             | 15-10-21        | "Recording Experiments Book #6. From Oct. 21, 1915"                          |

**Notebook Series -- Notebooks by Edison and Other Experimenters  
Recorder and Recording Experiments -- A. M. Kennedy Books  
Notebook, N-14-02-28.2**

This notebook was used by Absalom M. Kennedy during February-March 1914. The entries pertain to experimental recorders and amplifiers. The initial entries describe a series of experimental recorders produced by Harry W. Doyle. Each entry indicates the details of construction and the manner in which the parts were sealed and fastened together. Additional information about these recorders can be found in the unselected notebook, N-14-01-27.2. Following these entries is a daily record of experiments and tests performed by various laboratory staff on phonograph recorder and reproducer parts. These include tests with various distances, amplification speeds, types of recorders, and positions of recorders and voices. Some of the entries report results, such as loudness and quality of recorded tone. The notes indicate that the experiments were done by Archie D. Hoffman, Harry E. Humphrey, Miller Reese Hutchison, Alexander N. Pierman, and employees named Harper and Taylor (probably Henry A. Taylor). The front cover is labeled "Recording Experiments." The inside front cover is inscribed "Recording and Amplifying." The pages are unnumbered. Approximately 25 pages have been used.

59890

*Home Co.,*

MFG. STATIONERS,  
96 JOHN ST.  
AND  
19 PLATT ST.  
NEW YORK.

Recording and  
Amplifying.

RECORD OF  
RECORDERS.  
made by Doyle.

#1 Standard mica .0046"  
2 Gaskets  
.038" sapphire - .125" lap.  
Bees wax for peeling diaphragm  
to recording head.  
Shives to peel Arm to Diaphragm  
" " Sapphire to Arm.  
Tester out O.K.

#2 Mica .008"  
2 Gaskets  
.038" sapphire - .125" lap.  
Bees wax for peeling diaphragm  
to recording head.  
Shives to peel Arm to Diaphragm.  
" " Sapphire to Arm.

# 3

Mica .0025"

2 Gaskets

.038 Sapphire - .125" lip

Bas was for sealing diaphragm

gasket to recording head

Chelene to seal arm to diaphragm

" " " Sapphire to drum.

# 4

# 5

#6

#7

#8

Standard Micra .0046" diameter  
2 gaskets  
.003" sapphire - .125" lap.  
Standard sealing and fastening



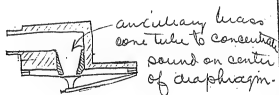
#9

#10

Standard

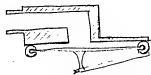
#11

Standard Construction except



#104

Special record made with  
rubber tube as supplied by  
Mr. Perman.



2/23/14.

Test made with 2 driving pulleys on amplifier, both top and bottom mahdrels. Gear also in mesh. Harper suggested that the amplifier may run better if driven from top or from both pulleys.

Tests were made driving from both pulleys, from bottom pulley and from top pulley and developed that the best results were obtained when driving from the bottom pulley. No reason therefore to change.

3/7/14

Test made amplifying at different speeds.

Test a piano record at 160-140-120-100 80-60-40 R.P.M.

Results not conclusive since the amplification was of a continuous record of varying loudness.

3/7/14.

Amplification from 7 records  
of alto voice in Gusman Talia  
H. Hoffmann. Same voice used  
in each case.

Amplification of above at  
40-60-80-100-120-140-160 R.P.M.

Results conclusive:

At low speeds the tones were soft  
and full - became louder and  
still natural at 100 R.P.M. Above  
this became still louder but  
sharp.

3/6/14.

Taylor made an  
experiment on amplifying.  
A piano record was made  
which when amplified as  
usual sounded rather like  
a bang. By increasing  
the speed of amplification to  
120 R.P.M., a much better  
quality of record was produced.

3/8/14 Amplification of 7 duplicate  
records made by Mr. R. H. each  
in loud and low tones.  
These were amplified at  
40-60-80-100-120-140-160 R.P.M.  
The first three were soft and  
natural but not loud. The  
fourth was still of good  
quality and louder. The  
symphonies were increasingly  
loud and sharp except  
the last which was not  
so loud as the one at  
140 R.P.M.

The low records perhaps  
were best at 120 R.P.M. while  
the loud records were best  
at 80 or 100 R.P.M.

At low speeds of  
amplification the reproduction  
is full and natural but low  
and with considerable surface.

At high speeds of  
amplification the reproduction  
is thin and sharp and loud.

Grow and other extraneous noises  
are reproduced at low speed. (11)

2/20/14

Tests by Mr. Humphries in  
padded cell.

Recorder #3 - Test at 5 ft in  
good full tone - Black Duck favored -  
trying to least and at 15', speaking  
to favor the distance

Recorder #1 - Test at 5' in  
good full tone - least speech favored -  
trying to least and at 15', speaking  
to favor the distance

Recorder by Mr. Purman. Same  
tests.

Results apparently showed  
#3 recorder best, Mr. Purman's  
next and #1 best, all however  
good.  
Mr. Purman's recorder appeared  
smoother than the others.

8/1/14.

Tuto with Miss Humphrey  
voice.

Made with #3 Recorder.

Resonance - good - full - sweet  
both of voice and of piano.  
Tendency to blacken  
on high or powerful or  
usual notes.

Miss Humphrey's voice  
is good - her qualities  
expression excellent - her  
enunciation fair. - She  
would record fine with  
practice.

| 3/2/14                 |                            |           |
|------------------------|----------------------------|-----------|
| Mr. Humphries Reading. |                            |           |
| #3. Records used       |                            |           |
| Distance               | Voice                      | Result    |
| 4'                     | True Tone                  | good      |
| 4'                     | "                          | "         |
| 6'                     | "                          | "         |
| 10'                    | "                          | "         |
| 15'                    | "                          | "         |
| 15'                    | loud                       | "         |
| 4'                     | rapid talking              | "         |
| 6'                     | "                          | "         |
| 10'                    | "                          | fair      |
| 15'                    | "                          | "         |
| 6'                     | dramatic                   | "         |
| 6'                     | good true tone             | very good |
| 6'                     | very loud                  | bleat     |
| 10'                    | Reading                    | "         |
| 5'                     | Reading from paper         | very low  |
| 5'                     | "                          | medium    |
| 5'                     | ordinary conversation tone | fair      |
| 5'                     | Stage                      | fair      |



3/8/14

Mr. Humphreys Recording  
#3 Recorder

| Distance | Voice                              | Remarks   |
|----------|------------------------------------|-----------|
| 6'       | fast conversation                  | good      |
| 10'      | "                                  | fair      |
| 15'      | "                                  | fair      |
| 6'       | light voice, full tone             | good      |
| 6'       | rapid conversation                 | good      |
| 10'      | "                                  | fair      |
| 15'      | "                                  | "         |
| 6'       | slow conversation, slightly pained | good      |
| 10'      | "                                  | very good |
| 15'      | "                                  | fair      |
| 4'       | rapid " quietly                    | good      |
| 4'       | slow " " "                         | good      |
| 2'       | rapid " " "                        | "         |
| 2'       | slow " " "                         | "         |
| 1'       | slightly exaggerated               | "         |
| 1'       | Full Deep Tone                     | "         |
| 1'       | " " "                              | "         |
| 2'       | " " "                              | "         |

3/5 Miss Dunwoodie - Sing at Piano  
#3 Recorder

20' - Singing  
Results generally good with  
exception of bleats on high  
strong or nasal sounds

15' - slightly better than at  
20'

Making test varying between  
6' and 20', best of all

Same test with #1 recorder.  
good. Less tendency to  
bleat

3/6/14  
Dis. Miss Dimmock. Skyes - Bang Piano  
Recorder # 3  
Recording Machine Standard  
Position

20' - Not enough volume

15' - better than above.

Same test but with  
recording machine 2' from floor.

20' - Volume increased and tones have  
not so much sharpness of  
edge as above.

15' - Same as 20' but not quite so  
pronounced.

3/7/14.

Mr. Humphreys Reading.  
 \* 3 Rec. bu. used.  
 Recorder in standard position.

| Distance | Voice                             | Result                       |
|----------|-----------------------------------|------------------------------|
| 1'       | Whispering                        | Very good.                   |
| 2'       | "                                 | "                            |
| 3'       | "                                 | "                            |
| 4'       | "                                 | Practical                    |
| 6'       | "                                 | "                            |
| 10'      | "                                 | Can hear but not loud enough |
| 15'      | "                                 | same                         |
| 6'       | Deep tone                         | very good                    |
| 10'      | "                                 | good                         |
| 20'      | "                                 | fair                         |
| 10'      | Loud tone                         | too loud                     |
| 15'      | "                                 | very good                    |
| 20'      | "                                 | better than 15'              |
| 4'       | Deep, heavy tone, sailors dialect | too loud                     |
| 6'       | "                                 | practical                    |
| 10'      | "                                 | very good                    |
| 15'      | "                                 | "                            |
| 20'      | "                                 | good.                        |

3/7/14.

Mr. Hemphries Recording  
#3 Record used.  
Recording Machine standard position.

Walking test.

| Distance | Voice                        | Result      |
|----------|------------------------------|-------------|
| 20'      | True tone - walking          | good        |
| 15'      | " " "                        | very good   |
| 10'      | " " "                        | good        |
| 6'       | " " "                        | trifle loud |
| 4'       | " " "                        | loud.       |
| 20'      | Declamatory low tone walking | good        |
| 15'      | " " "                        | good        |
| 10'      | " " "                        | good        |
| 6'       | " " "                        | faint least |
| 4'       | " " "                        | least       |

These tests repeated with same results.

It was noted that the results when walking were better than when standing.

3/7/14.

Mr. Humphries Recording.  
+ 3. Rear View used.  
Regarding Machine Standard Position.  
Test, standing firm and balanced on  
toes.

| Distance | Voice                       | Results    |
|----------|-----------------------------|------------|
| 20'      | Oratund. - Standing firm    | good.      |
| 20'      | " - Balancing               | Very good. |
| 18'      | " - Standing firm           | good.      |
| 15'      | " - Balancing               | Very good. |
| 10'      | " - Standing firm           | good.      |
| 10'      | " - Balancing               | Very good. |
| 6'       | " - Standing firm           | Good.      |
| 6'       | " - Balancing               | Very good. |
| 20'      | Declamatory - Standing firm | Fair.      |
| 20'      | " - Balancing               | Good.      |
| 15'      | " - Standing firm           | Good.      |
| 15'      | " - Balancing               | Very good. |
| 10'      | " - Standing firm           | Good.      |
| 10'      | " - Balancing               | Very good. |
| 6'       | " - Standing firm           | Fair.      |
| 6'       | " - Balancing               | good.      |

Decided improvement in  
quality in each case when  
balancing on balls of feet.

3/7/14.

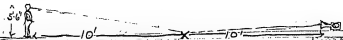
Mr. Humphreys Recording.  
#3 Record used.

Recording machine on floor.

This test was made to determine the best distance to point the voice which recording machine on floor.

| Distance Standing | Distance Pointed at | Voice                   | Result.   |
|-------------------|---------------------|-------------------------|-----------|
| 20                | 15                  | Natural - Standing firm | Good      |
| "                 | "                   | " - Balancing           | better    |
| 20                | 10                  | " - Standing firm       | Very good |
| "                 | "                   | " - Balancing           | better    |
| 20                | 6                   | " - Standing firm       | Good      |
| "                 | "                   | " - Balancing           | better    |
| 20                | Horn                | " - Standing firm       | fair      |
| "                 | "                   | " - Balancing           | better    |
| 20                | about ten           | " - Standing firm       | fair      |
| "                 | "                   | " - Balancing           | better    |

Results show that for this test voice should be pointed half way between position and recording machine. Previous test proves that recording machine should not be used on floor except at distances of 20' or more.



8/7/14

Mr. Humphreys Recording  
#3 Recorder Used  
Recording Machine Standard Position.

| Distance<br>Standing | Distance<br>Balanced at | Voice      | Result             |
|----------------------|-------------------------|------------|--------------------|
| 20                   | 15                      | Lead Voice | Standing firm good |
| "                    | "                       | " "        | Balancing better   |
| 20                   | 10                      | " "        | Standing firm good |
| "                    | "                       | " "        | Balancing better   |
| 20                   | 6                       | " "        | Standing firm good |
| "                    | "                       | " "        | Balancing better   |
| 20                   | Horn                    | " "        | Standing firm good |
| "                    | "                       | " "        | Balancing better   |
| 20                   | Below Horn              | " "        | Standing firm good |
| "                    | "                       | " "        | Balancing better   |

Results balancing in all cases  
better than standing firm.



3/7/14.

Doyle and Kennedy Recording  
#12 Barrow Alced  
Recording Machine on floor.

Standing at 20' from horn, <sup>test</sup>  
to determine best position to  
speak voice.

| Stand | Point | Person  | Result |
|-------|-------|---------|--------|
| 20'   | 15'   | Doyle   | good   |
| 20'   | 10'   |         | best   |
| 20'   | 6'    |         | good   |
| 20'   | horn  |         | fair   |
| 20'   | own   |         | fair   |
| 20'   | 15'   | Kennedy | good   |
| 20'   | 10'   |         | best   |
| 20'   | 6'    |         | good   |
| 20'   | horn  |         | fair   |
| 20'   | own   |         | fair   |

8/7/14

Tests by Doyle & Kennedy  
#3 Recorder used.

Recording Machine on floor.

Repetition of same test except  
Balancing test included again.

| Stand. | aim     | Person  | Result | Balance. |
|--------|---------|---------|--------|----------|
| 20'    | 15'     | Doyle   | good   | better   |
| 20'    | 10'     |         | better | best     |
| 20'    | 6'      |         | good   | better   |
| 20'    | long    |         | fair   | good     |
| 20'    | unknown |         | fair   | good     |
| 20'    | 15'     | Kennedy | good   | better   |
| 20'    | 10'     |         | better | best     |
| 20'    | 6'      |         | good   | better   |
| 20'    | long    |         | fair   | good     |
| 20'    | unknown |         | fair   | good     |

3/24/44.

Data from Sluick's.

A standard recorder should have mica diaphragm from .004" to .005" thick with 2 rubber gaskets, each  $\frac{1}{32}$ " thick. The gaskets must conform to the recorder head and align perfectly. Diaphragm must be aligned with gaskets. Then held firmly and temporarily fastened with spacers, about 3 of each. Then released and was run all around so as to make a perfect seal.

Needle arm is to be cut from sheet aluminum about .007" thick and should measure from edge of recorder, diametrically to opposite edge of hole (about  $\frac{1}{16}$ "). A piece of the above sheet aluminum about  $\frac{1}{16}$ " x  $\frac{7}{16}$ " is bent over a piece of .040" wire, and by pliers & vise neatly made into shape.

# RECORDERS.

|     |          |                 |     |
|-----|----------|-----------------|-----|
| #1  | Standard | .0048 diaphragm | .80 |
| #2  | "        | .0047           | .80 |
| #3  | "        | .0048 X         | .70 |
| #4  | "        | .0050           | .85 |
| #5  | "        | .0088 X         | .65 |
| #6  | "        | .0045 X         |     |
| #7  | "        | .004            | .80 |
| #8  | "        | .004 X          |     |
| #9  | "        | .0055 X         | .65 |
| #10 | "        | .004            | .80 |

**Notebook Series -- Notebooks by Edison and Other Experimenters  
Recorder and Recording Experiments -- A. M. Kennedy Books  
Notebook, N-14-08-21**

This notebook was used by Absalom M. Kennedy during September 1914-March 1915 as a daily record of experiments and tests with phonograph recorders and reproducers. The record is continued in N-15-03-17. The tests involve various recording heads, arms, and diaphragms; gaskets; and speaking tubes. Also included are tests of machines to reproduce cylinder records from disc masters. Some of the experimental recorders were sent to the recording studio for testing, with the results reported back to Kennedy. The entries also describe other work by Kennedy, including experiments on film cements and cellulose mixtures for motion pictures, which are related to experiments in N-14-01-01.3 and N-14-01-12, Notebooks by Other Experimenters—Kinetophone and Kinetoscope Experiments. Also mentioned are meetings with Leonard W. McChesney and other employees in regard to "The Birth of the Telephone," a kinetophone film about Alexander Graham Bell. Kennedy's notes often mention Edison's own involvement in the phonograph experiments, including his opinions and suggestions about particular recordings or masters. Other individuals involved in the work include Clarence B. Hayes, William H. Meadowcroft, Walter H. Miller, Sherwood T. (Sam) Moore, William F. Nehr, George J. Werner, and an employee named Finlayson (possibly William F. Finlayson, who worked for Edison in 1903). A two-page note from Kennedy to Miller Reese Hutchison, with Edison marginalia, has been inserted into the book. The front cover is labeled "Daily Record of Recording Experiments" in ink and "A.M. Kennedy" and "Cement" in pencil. The pages are unnumbered, and several pages have been removed from the book. Approximately 140 pages have been used.

Sept. 21, 1914.

Stretching recording diaphragm of  
Cellulose Acetate + 50% camphor .0015"  
thick by wetting with methyl  
alcohol, pulling tight and allowing  
to dry. Stretch good and tight.  
George is building up a recorder  
with this.

Tried another with cellulose  
acetate diaphragm .0015" thick stretch  
by wetting with water as  
suggested by Mr. Edison. The  
water did not expand the  
diaphragm sufficient to  
stretch.

Tried putting diaphragm as  
above in boiling water. Turned  
opaque & translucent and  
white and stretched on cooling,  
apparently not as much as  
by the alcohol method above  
however.

Made several piano records with  
stretched diaphragms which

9/11/14 contd

George Mervin had put up.  
As piping records these were  
good but did not exhibit any of  
the unusual qualities as  
described by Mr. Edison.

Played for Mr. Edison records  
showing recording from Disc  
Cyl. Master to Cylinder Master.  
He said these were good and to  
go ahead with it, that  
Haves would select the records  
and Moore would furnish  
special smooth cyl. masters if  
necessary. Showed him also  
Piano records with stretched  
records. He said these were  
about as good as ordinary  
records would do but not  
the unusual results he was  
looking for. To go ahead and  
get these better results.

Sept. 28, 1914.

Made solution of celluloid film in acetone. Mixed with this a solution of shellac in alcohol. Poured this over a glass plate. Found that on drying the center turned white and in ridges while the edges remained transparent. Probably due to the fact that at the edges both acetone and alcohol evaporated nearly evenly while in the center, on account of slower evaporation, the acetone evaporated first, leaving the alcohol to absorb a little moisture before evaporating and turning both celluloid and shellac white.

Had difficulty in stripping film from glass. Found that by moistening film with alcohol and rubbing over with a dampened rag or by dampening with solution of



9/5/14

80% alcohol + 20% water, the  
film easily stripped from the  
glass.

Made up for George Nernst  
an aluminum ring - 1 1/2" external  
and 1 1/8" internal diameter x .010"  
to try and keep his diaphragms  
from being too sensitive.

George Nernst made photo tests  
with several records and  
with Dp (kilowatts) in  
Bass got one to show ring of  
25 seconds.

Made up diaphragm with  
two arms



This proved less sensitive than  
with only one arm.

Sept 23-1914.

Curious change of tension of diaphragm

Norman was working on two  
recorders, one with boys' diaphragm  
stretched by coils - the other stretched  
by partial solvent alcohol yesterday  
afternoon & left them on his bench.

On examining them this morning  
both were loose and flabby. After  
handling a few minutes the alcohol  
stretched one tightened up O.K.  
The other tightened on heating the  
head.

Evidently both had been  
stretched to their elastic limit on  
the warm afternoon previous and were  
flabby on this cool morning.

It will be necessary to hold  
them at moderate temperature  
for these diaphragms to be practical.

9/23/4. contd

Tried dissolving shellac in acetone. Difficult cold. Dissolves hot.

Made mixture hot shellac in acetone solution and added to solution regular celluloid film in acetone. Poured on glass. Center turns white & opaque.

Unsuitable for diaphragm purposes. Would probably be a suitable mixture for dead surface mirrors.

Made solution of Acetyl Cellulose Cotton in Chloroform. Dried rapidly but with whitish patches in center. This film seems to be good and tough. Is not smooth enough however. Will have to make them smoother probably by beating the solutions and seeing that a level even solution is on the glass plate and that it dries rapidly.

9/23/14.

Made solution of Acetyl  
Cellulose Cotton in Acetylac-  
etate. This dries to an  
exceedingly clean tough film.  
As before the film is rough  
and I must learn to make  
them smooth.

Ran taking pictures for  
M.P.S. for some people from  
Mobile.

9/24/14.

Made 6-disc to cylinder records.  
Trials - 3 masters.

Revised reproducing machine.

9/28/14.

Made solution of gum sandarac in acetone and added celluloid film. This mixture will not do for diaphragms as it is too brittle to strip from glass readily. It would make a good flat coat varnish as it dries with a good dull finish and on glass is hard and resists rubbing.

Added to this solution small amounts of castor oil. Result N. G. Film stays soft & adheres to separate. Makes a waxy like film.

9/29/4.

Tested out records made 9/24/4.  
They proved conclusively

- ① That the unreproduced record is better than one which has had the master reproduced.  
② That the best combination for records made was:
- |             |     |   |
|-------------|-----|---|
| Reproducer  | #1. | } |
| Quadrant    | #2  |   |
| Reading Arm | #5  |   |
| Records     | #2  |   |
- Gave best results.

Made up solution of acetyl cellulose in acetophene tetrachloride and of gum sandarac in acetophene tetrachloride.

Got two pieces of belished plate glass about 30"x20"x1/8" & levelled one of them. Paired following rotations to produce films for trial.

- ① Acetyl Cellulose in acetophene tetrachloride  
② Same with addition of equal amounts of solution gum sandarac

in acetylene tetrachloride.

Trued out new stretched-diaphragm  
with Geo. Meyer. Results seem to  
be good on piano.

RECORD FOR W.E.CO.  
BY MR. HUTCHISON.

Made record of reading from  
book by Mrs. Hutchinson for  
Telephone reproduction by the  
Kinetophone. Made two  
trials on master.

① Reader #10  
Horn #3

② Reader #10  
Horn - regular Kinetophone Recording.



11/4/14.

Experiment quality of records  
using -

- ① Retrogen #1  
Discern #

Experiments on  
Falm Cements

- #1 Equal parts of Methyl Alcohol,  
Amyl Acetate, Benzole  
and Acetone with about  
15% Emphor.
-

#1 Sent to Recording Dept.

#2 Sent to Recording Dept. 7/5/50  
Tents 3/10/51 with 1 meter diam cone  
to piano for holding. Big, natural  
tone. Made single notes with  
grip & puccin in low cords.

#3 Sent to Recording Dept.

12/8/12.

Stretched Diaphragm  
Record Heads sent to  
Recording Dept.

#1 - 2" diam  
Diaphragm .0014 of pure  
acetyl cellulose, dried from  
acetylene tetrachloride. Stretched  
by freezing.

#2 - 2" diam.  
Diaphragm .001 of pure  
acetyl cellulose, dried from  
acetylene tetrachloride. Stretched  
by wetting with 75% methyl  
alcohol + 25% water & allowing  
to dry.

#3 - 2" diam.  
Diaphragm .003 of pure  
acetyl cellulose, dried from  
acetylene tetrachloride. Stretched  
by freezing.

#4 sent to Recording Dept.

#5 sent to Recording Dept.

#6 sent to Recording Dept.

#4 - 2" diam.

Diaphragm 0014 of pure  
acetyl cellulose dried from  
acetyl. tetrachloride. Stretched  
by freezing.

#5 - 2" diam.

Diaphragm 001 of pure  
acetyl cellulose dried from  
 $\text{C}_2\text{H}_5\text{Cl}_4$ . Stretched by  
freezing.

#6 - 2" diam.

Diaphragm 00135 of pure  
acetyl cellulose dried from  
 $\text{C}_2\text{H}_5\text{Cl}_4$ . Stretched by  
freezing.

Made one  
9/1/15  
Mum 9/1/15  
9/5/15

- #4 - Set up with  $\frac{7}{8}$ " domed aluminum center, .006", regular arm, .038" sapphire, flat back.  
 Notes 9/10/15 - Kusto. Arm close to piece.  
 Little lined. Heads purple notes & high ends, blasts on low ends.  
Quality very good.

Made one  
9/1/15  
Mum 9/1/15  
9/5/15

- #10 - Set up with  $\frac{7}{8}$ " domed aluminum center, .004" - flattened arm, .038" sapphire, flat ball.  
 Sounds too fully tubing - not clean - does not differentiate notes.  
 Notes 9/10/15 - Same as above but not quite so good for backing a quality code.

## Resolders Made and Kept

- #4A - Diaphragm of cellulose acetate .001" - dried from  $C_2H_5OH$  solution. Stretched by freezing with  $CO_2$ . With  $\frac{7}{8}$ " aluminum domed center. Stretched on 2" head. .038" sapphire, set standard.  
 Made one 9/17/15  
 Mum 9/17/15  
 9/17/15
- #10 - Diaphragm of cellulose acetate .0015" - dried from  $C_2H_5OH$  sol. 2" head. Stretched by freezing with  $CO_2$  (use  $\frac{7}{8}$ " aluminum domed center). .038" sapphire set standard except flattened arm.  
 Made one 9/17/15  
 Mum 9/17/15  
 9/17/15
- #12 - Diaphragm of cellulose acetate .0015" - dried from  $C_2H_5OH$  sol. 2" head. Stretched by freezing with mixture equal parts  $C_2H_5OH$  and  $H_2O$  following to dry. With  $\frac{7}{8}$ " aluminum center domed. .038" sapphire set standard.

#2\* - Set up with  $\frac{1}{16}$  domed center,  
.004" aluminum. Flattened arm,  
.038" sapphire.

#3

Broken later  
see later

#70

Broken  
see later

#2 Sent to Alden St Studio

5/16/68  
M. J. O. S.

#2\* - 2" head. Diaphragm .001" thick  
of cellulose acetate, dried from  
solution in  $C_2H_5Cl$ . Stretched  
by wetting with equal parts  
 $CH_3COH + H_2O$  & drying out.  
 $\frac{1}{8}$ " domed aluminum center part  
on - .038" needle in flattened arm.  
(Did not have failed ball to  
complete).

#3 - 2" head. Diaphragm .0035" thick  
of cellulose acetate & 50% gum  
sandara. Stretched in  $C_2H_5Cl$ .  
Stretched by wetting with 1 part  
 $CH_3COH$  to 2 parts  $H_2O$  and  
drying out.

#20 - 2" head. Diaphragm .003"  
thick of cellulose acetate, dried  
from  $C_2H_5Cl$  solution,  
stretched by wetting with  
equal parts  $CH_3COH + H_2O$ .

#21\* Same as above except  
released by wetting with solution  
1 part  $CH_3COH$  to 2 parts  $H_2O$ .

5/16/68  
M. J. O. S.

## Experiments with Cellulose Mixtures.

- ① Tried to dissolve Gum Dammar in  $C_{60}H_{12}O_4$ . Will dissolve, but slowly by heating. Used 50% of this with 50% heavy solution of cellulose acetate in  $C_{60}H_{12}O_4$ .

Film unsatisfactory. Much stretch & bend slowly when warm (about 70°) but even at this temperature caused crack when quickly bent. When cooled to about 40° caused crack very easily.

- ② Film made as above but with about 5% gum dammar solution. Dried with "flat" - no glass surface. Better than ① but still feels soft & sticky to touch. Do not think will prove satisfactory.

- ③ Tried to dissolve Gum Sandarac in  $C_{60}H_{12}O_4$ . Very difficult even when hot. Made mixture of

Such solution, estimated at 5% gum  
with 95% solution cellulose acetate  
in C<sub>2</sub>H<sub>5</sub>Cl. Film from this looks  
promising. It cracks a little more than  
pure cellulose acetate when suddenly  
bent but is hard & springy. Set up  
# 3 Recorder head with this.  
Makes good flat surface varnish

- (14) Tried to dissolve Gum Sandarac  
in Amyl Acetate. Dissolves in any  
quantity but rather slowly. Made  
solution 50% above with 50%  
celluloid film in Amyl Acetate. Have  
an alligatored surface film, a  
little flat but which film adhered  
to the glass plate so strongly  
that it was difficult to remove  
even after softening with  
acetone & water. Film also  
turned white in spots with  
stripping. Does not look good  
for diaphragm purposes.

- (15) Dissolved celluloid film in  
Amyl Acetate. Dries with slight  
ridges from glass plate but



looks good for diaphragm purposes.  
strips easily.

#20 - Sent to Allen St. Studio.  
 Hervey reports that disc record  
 was made with this in  
 comparison with regular records,  
 but that master was broken in  
 St. Vils.  
no master prepared by Mr. Edison

#3 -

Queen Records  
 2/6/15  
Ground  
Rehearsal  
See Action

#41 - Sent to Allen St. Studio

Made over  
 2/19/15

Records 1/4/15

#20 - 2" head. Diaphragm .003 thick  
 of celluloid film from solution  
 in Amyl Acetate. Stretched  
 by wetting with 2 parts H<sub>2</sub>O  
 to 1 part (CH<sub>3</sub>)<sub>2</sub>CO.

#3 - 2" head. Diaphragm .001 thick  
 of celluloid film dried from  
 solution in Amyl Acetate.  
 Stretched by ailing head where  
 touches diaphragm &  
 wetting diaphragm with  
 2 parts (CH<sub>3</sub>)<sub>2</sub>CO + 3 parts H<sub>2</sub>O

#41 - 2" head. Diaphragm .001 thick  
 of celluloid film dried from  
 solution in Amyl Acetate.  
 Stretched by ailing head where  
 touches diaphragm & wetting  
 diaphragm with 2 parts (CH<sub>3</sub>)<sub>2</sub>CO  
 + 3 parts H<sub>2</sub>O & stretching  
 when wet and allowing to  
 dry.

Made over  
 2/19/15

Made on 10/17/5  
See later

#10 - Set up with  $3/16$  flat  
dome .006" thick aluminum,  
regular arm, .028" sapphire,  
195 amp. wax & resin used to  
fasten.  
Parts out too full & tubby,  
& little blast. Deflection not  
clear.

#11 - Sent to Alden pt Studio

Made on 10/17/5  
See later.

#12 - Regular 2" recorder head.  
Diaphragm .001" of regular  
film stock dried from solution  
in amyl acetate. Stretched by  
wetting with 5 parts  $H_2O$  + 1 part  
 $(CH_3)_2CO$  & pulled tight and  
allowed to dry. Seems good  
and tight. SET - C.P. -

#22 - Regular 2" recorder head.  
Diaphragm .002" of regular  
film stock dried from  
solution in amyl acetate. Stretched  
by wetting with equal parts  
 $H_2O$  +  $CH_3OH$  & pulled tight  
and allowed to dry. Seems  
good & tight.

### Experiment in Recording

- ① Mr. Edison wished to experiment on recording particularly for grand opera records and especially for those with more than one voice.

In former records he detected that the singers do not keep together either in time or pitch and assigned as a reason that each one heard the other and if the second one was off - even slightly in time or pitch, the first would follow him and the result be more or less confusion. He therefore tried an experiment in which singers regularly he detected "beats" in this and in these voices due to their not being in exactly the same pitch. He then had one of the voices sing in a horn which ear tubes to the other "voices" ears. In this way the "beats" were eliminated.

He suggested that the same result may be accomplished with telephones in which a leader sings into a transmitter and the recording voices had receivers on their ears.

At first the telephones were so loud as to be annoying to the singers. When they were reduced in loudness, the singers still complained that they were confusing even though they could not hear distinctly. This was deemed a failure on account of the telephones not being clear enough.

Speaking tubes were then rigged up so that a leader could sing in a horn and be followed by the recording singers.

On trial with out these tubes contrasted with a trial with the tubes, the latter was found to lead the singers together better on time (two trials), the record showing quieter, cleaner, happier, and that the sound directly in

Their ears without outside  
interference held them together  
tightly.

Another experiment was tried  
at the same time in which  
the ear tubes were attached to a  
reproduced on disc phonograph  
on which was a ~~instrumental~~  
record of Quartette from Rigoletto.  
This proved confusing to the  
singers and the record deemed a  
failure.

---

#13 Sent to Recording Studio  
1/27/15  
"Rough Cut and too full tone"  
(Re. Studio)  
2/1/15

Reels 1/15  
See later

#14 Sent to Recording Studio  
1/29/15

"Peak-cut fair cut"  
(Re. Studio)  
2/1/15

#15 Sent to Recording Studio  
1/29/15

"Too full - Rough Cut"  
(Re. Studio)  
2/1/15

Destroyed smoke over with  
heater diaphragm. See later

1/27/15  
#23 - Head  $1\frac{1}{4}$ " external x  $1\frac{1}{2}$ " internal  
Diameter. With film of nitro cellulose  
.003 thick dried from solution  
of amyl acetate stretched by  
water which equal parts  
(CH<sub>3</sub>)<sub>2</sub>CO & H<sub>2</sub>O.

#24 - Head  $1\frac{1}{4}$ " external x  $1\frac{1}{2}$ " internal  
diameter. With film of cellulose  
(found). .005" thick stretched by  
swelling with equal parts (CH<sub>3</sub>)<sub>2</sub>CO  
and H<sub>2</sub>O, spilling, light clamping,  
and allowing to dry.

#25 - Head, aluminum, 2" external,  
 $1\frac{1}{2}$ " internal diameter. Film of  
nitro cellulose (from stock) dried  
from solution in amyl acetate,  
.002 thick stretched by swelling  
with equal parts H<sub>2</sub>O & (CH<sub>3</sub>)<sub>2</sub>CO,  
pulling, light clamping and  
allowing to dry.

Sent to Rec. Studio  
1/29/15

Sent to Rec. Studio  
1/29/15

#26 Pints to Recording Studio  
1/29/15

"Too full - Rough Cut"  
(Rec. Studio)

Made over 2/9/15. Sa later

#27 Queen Geo Meyer 2/5/15  
Tested 2/10/15 until limits then close to pins on  
holding test. Marks single note. Black  
on cords. Fair quality.

Made over 2/10/15  
#28 Queen Geo Meyer 2/5/15  
Tested 2/10/15 until limits then close to pins on  
holding test. Not so good as 27 above  
in holding or quality.

#26 - Aluminum head - 2" external -  
1 1/4" internal diameter. Diaphragm  
of film stock dissolved in Amyl  
acetate. ~~Stock~~ .002" thick. Put  
on ~~up~~ <sup>up</sup> settling with equal parts  
(CH<sub>3</sub>)<sub>2</sub>CO & H<sub>2</sub>O, stretching, clamping  
and allowing to dry.

2/1/15  
#27 - Brass head - 2" external, 1 1/2" internal  
diameter. Diaphragm of film  
stock dissolved in Amyl acetate  
and dried - .002" thick. Lightened by  
settling with equal parts (CH<sub>3</sub>)<sub>2</sub>CO  
& H<sub>2</sub>O, stretching, clamping and  
allowing to dry.

#28 - Brass head - 2" external, 1 1/2" internal  
diameter. Diaphragm of film stock  
dissolved in Amyl acetate & 2%  
acetone dried. .002" thick. Lightened  
by settling with equal parts (CH<sub>3</sub>)<sub>2</sub>CO  
& H<sub>2</sub>O & stretching, clamping &  
allowing to dry.



1/22/15.

Made up same four ear tubes connected to longer brass tube to be more convenient for the singers.

Hayes made up quartette consisting of Miss Rensen, Miss Sales, Mr. Meadowcroft and himself with Miss Ingrid at the Piano.

Made trial of "Gloria" without and with the above tubes.

The records in both cases were poor, whether the fault was due to the singers or the recording, could not determine. The result was not conclusive although as shown on former trial it seemed that this quartette kept better time - but is kept together better with the tubes than without.

Tried "at the Mill Maggie" with similar results. Record did not show up as good as previous record made of same quartette singing "Pigolotto". Result as before - inconclusive.

Made solo record of Miss A. Rensen singing from "Traviata".

Record good. This little girl of  
about 15 has a good clear even  
voice, good interpretation, and  
puts life into her song. She will  
probably develop into a good  
singer and actress.

Am not satisfied with the  
recording work which has been  
done. Think that part of our trouble  
at least was with the technical  
recording. Will try and have  
recorder and machine 2 hours up  
and in good shape before the  
next record is taken.

#29 -

Harped while being  
cut up. See later

#30 -

Queen Geo Werners 2/5/15 -  
Tested 2/10/15 with much blow above  
A piano for knocking - Sounds  
dead. Does not carry any of  
piano. Werners stated quality fair

#29 -

2/3/15.  
Regular Brass Head, 2" External,  
1 1/2" internal diameters,  
Diaphragm stock celluloid (found)  
005" thick. Stripped by cutting  
with equal parts  $(CH_3)_2CO$  &  $H_2O$ ,  
allowing to swell, tightening,  
clamping & allowing to dry.

#30 -

Regular Brass Head - 2" External,  
1 1/2" Internal Diameters.  
Diaphragm, celluloid acetate  
dried from solution in  
acetyl chloride, 0025"  
thick. Tightened by cutting  
with equal parts  $(CH_3)_2CO$  &  $H_2O$ ,  
allowing this to soften film,  
stretching, clamping & allowing  
to dry & tighten.

Made and 7/14 See later.

#29

Set up (Aval) with  $\frac{1}{16}$  aluminum dome  
.006 - regular arm - 038" x .125" sapphire,  
flat-top yellow ball - (2/2/15).  
Green No. 1000 9/5/15

---

#29 - Regular 2" Brass Head  
2" External - 1 1/2" Internal Diameter.  
Diaphragm of Stock Celluloid (found)  
.005" thick. Stretched by freezing  
head with CO<sub>2</sub> - clamping and  
allowing head to expand on  
warming.

---

Made and  
9/17/14 See later

2/5/15.

As Mr. Meadcroft complained last time that the leader did not sound loud enough through the tubes, had longer tubing between cross member and ear tube's proper.

Had Misses (Soprano, Soprano) Yates (alto) and Ingrid (Pianist) with Hayes to sing, two of Carmen.

Had trouble with recording and reproducing machines at first.

Made 5 trials of Carmen without tubes until we got a fairly good one.

Triad tube system, Miss Ingrid singing soprano in business phono tube horn as leader.

Result showed that trio kept together O.K. as to time but the soprano was badly off on pitch - about 1/2 tone flat.

Next gave Miss Ingrid another horn, called Japanese in one. Result better than before but still off pitch.

Then had Miss Ingrid play the air as well as accompaniment.

on the piano during hour so this  
moves just as leader. Result  
better than former but still not  
so good as without tubes, as  
regards pitch. In Lympo however,  
they seemed to stay together better  
with the tubes than without.  
Will try pads on tubes and  
telephones with time.

---

Q-mate 2/10/15 See later.

#3 Given to Hayes 2/9/15.  
Tested Out 2/10/15. Gives  
a record which is thin &  
sharp. CONTRAST WITH FORMER  
reports. Punctured in reassembly.

---

2/9/15

#3 - Regular Brass Head, 2" external,  
1 1/2" internal diameters. Diaphragm  
of white celluloid, purchased from  
The Celluloid Co. of Newark, 0.055"  
thick. Stretched by freezing the  
head and at the same time blowing  
on the diaphragm to heat and  
moisten it.  
(Shooled very tight)

---

2/9/15. ✓

Had Finlayson make up new master reproducers for 10 days. First one made with counterweight did not track well. Changed it by cutting the weight in half, and adding  $\frac{1}{8}$ " to the short end of the replan disc lever. Also put a .040" lip in place of the diamond. Days says it reproduces fine.

Fixed up telephones with induction coil for test of quartette tomorrow

Attempted to make Ear Pads to fit the ear tubes. These could be made to fit but were not sound proof. It seems a very difficult job to make sound proof ear pads.

Made up #3 Record; gave to Days to Test Out. See previous page.



8/10/15. ✓

Got Morris & Hayes over and tested  
out stretched records for feeding  
with the following results:

- A - Feil. Unnatural. Not very  
sensitive.
- ✓ - Big Tone. Starts well on  
single low bass notes. Goes  
all 4 pieces on hand full  
of cords.
- 28 - Thinner than # 7 and doesn't  
hold as well.
- 27 - Starts single notes well. Starts  
on cords.
- 4A - Good quality on high  
notes. Starts on low  
strong cords.

✓  
10- Good quality on high & single notes. Blasts on cords. Found that the needle was loose & tightened. Results heard better.

112- Blasts best on single notes and on cords. Dec. quality on high notes.

#80- Soft. burst. Halbs single notes <sup>high</sup> & cords. Blasts only on low cords. Fair quality.

#29- Some loose from diaphragm.

In previous test, Phonophone recording horn was used close in spring grand piano. Notes into #1's 44, 10 with small horn.

#10 seems rather flat & dead. Does not carry the ring of the piano. Never pronounced for quality.

#4A. Quality pretty good.  
not very loud.

afternoon

Misses Rensen, Fatis and Ingrid  
came out.

Tested Misses Rensen (DePizmo) Fatis,  
Alto) & Hayes (Reno) singing Quinata.  
Made good record without  
telephone.

Used head telephones connected  
to N.E. transmitter through  
induction coil on fingers. Miss  
R said that the telephones were  
also annoying than ear tubes.

Records with telephones (3) showed  
distinctly more in pitch than the  
records without. In time they were  
perhaps a little closer together with  
than without telephones.

These results were confirmed by  
Chas. Edison.

Made tests of before mentioned  
pingers pinging arpeggios & scales  
without telephones.

They kept better together in  
pitch without than with the  
Hulus. This was confirmed by  
Chas. Edison. ✓

Tested #4 & #10 Records with  
voice recording. #4 was  
slightly buried. Excellent quality.  
#10 had squeaks, was more  
buried and not so good.

---

2/11/15

With Demonstrators all day

2/12/15

With Demonstrators all day

2/13/15

Correct Examination Papers.

2/15/15

Write Report

Made up acetyl cellulose solution  
with 90% acetyl tetrahydro, 10% acetone  
& flowed on glass for film.

Turned up brass plate for  
stretching films when stretching

Stretching recorder #5 of  
100% acetyl cellulose, heated. Stretches  
very tight.

#25 - Given Re-reading Apr. 2/7/15.

#3 - Given M. Hayes 2/7/15 to set up.

Tested out 2/22/15. "Not as loud as standard. - Beats slightly on loud chords. Quality sharper than #4.

2/15/15 -  
#25 - Aluminum head 2" external, 1 1/2" internal diameters. Diaphragm of cellulose acetate from acetone nitrate, .0025" thick. Stretched by applying heater source of brass to diaphragm, pulling tight & damping. Seems to stretch very tight in this way.

2/16/15 -  
#3 - Brass head - 2" external, 1 1/2" internal diameters. Diaphragm of white stock cellulose, punched from the cellulose originally .0055" thick. Rubbed down with sand, paper to .0045" thick. Stretched by laying piece of brass heated to about 200° F on it, pulling tight and damping. Seems very tight.

2/16/15.

Stripped film of yesterday. Strips easily by softening with mixture acetone & water. Curled though. Corrected this by wetting with same solution on reverse side.

Made solution of acetyl cellulose in acetone tetrachloride 80% and amyl acetate 20%. This makes a clearer and more perfect solution than acetone tetrachloride alone as all of the cotton seems to dissolve in it while strings of undissolved cotton almost always remain in acetone tetrachloride alone. Added too much cotton so that solution was too thick & tried addition of about 10% acetone and afterwards 10%  $C_6H_6$  to solution. The cotton would not dissolve in this solution and mixture was thrown away.

Made new mixture of 21 parts Acetone tetrachloride and 4 parts Amyl Acetate. Added acetyl cellulose to this and heated over radiator.

Heated alone, strained & poured on glass for film. Seems of this thin. Finished dry stretching & recording.

2/17/14.

Stripped film made yesterday  
and dried overnight. Is too thin.

Packed recorders made to be sent  
to Mr. Miller and to Nernst.

Had Ruhs make new punch and  
some longer fellow had arm screws  
for Hayes.

Saw about Demonstrators working.  
Stretched diaphragms in new  
recorders.

Made up solution of acetyl  
cellulose in  $C_2H_5Cl$  - heated  
& strained - cleaned glass & poured.



#26 - Given Recording Dept. 2/17/15

#23 Given Recording Dept. 2/17/15

#24 Given Recording Dept. 2/17/14.

2/16/15.  
#26 - Aluminum head - 2" external, 1 1/2" internal diameters. Diaphragm of old Cellulose Acetate film, left by Rierman, .004" thick. Stretched by laying on brass heated to about 212° F. stretching tight, clamping and allowing to cool. Seems good and tight.

#23 - Brass head - 1 1/2" external, 1 1/4" internal diameters. Diaphragm of old material, left by Rierman & marked "1/2 camphor (from cellulose acetate from burning test) - .0035" thick. Stretched by laying on cylinder of brass, heated to about 212° F. stretching tight, clamping and allowing to cool. Seems good and tight.

#24 - Same as #23 except diaphragm .004" thick.

#28 - Given N. Hayes 2/17/15 with  
arm etc. complete.  
Tested 2/23/15. pt test - "Racba"  
mus - "weaker than standard"  
- "Quality Fair."  
Mid Test - "not sensitive" - "damped  
note".

Made sum  
2/1/15

#2 - Given Geo. Nemes 2/17/15 with  
arm etc. complete.  
Tested 2/23/15. "Little weaker  
than standard - Beats on low  
chords - Fair quality".

Made sum  
2/1/15

2/10/15  
#28 - Brass Head - 2" external - 1 1/2" internal  
diameters. Diaphragm of old  
material left by Rierman, according  
to pile & burning consists of  
cellulose acetate & camphor  
.004" thick. Stretched by putting  
on cylinder of brass heated just  
above 212°, tightening & clamping.  
Seems good & tight.

Made sum  
2/1/15

2/17/15  
#2 - Brass Head - 2" external - 1 1/2" internal  
diameters. Diaphragm of cellulose  
acetate from solution in C<sub>2</sub>H<sub>5</sub>Cl  
.003" thick. Stretched by laying  
on heated brass cylinder, about  
212° - tightening & clamping.  
Seems good & tight.

Made sum  
2/1/15

#29 Given Geo Hemen 2/7/15  
Tested 2/23/15. Head - 1/2 lbs. wet.  
Quality not good.

Made and  
2/24/15

#10 Given Geo Hemen 2/7/15

#2A Given Geo Hemen 2/7/15

2/17/15  
#29 - Brass Head - 2" External, 1 1/2" Internal  
diameters. Diaphragm of cellulose  
acetate from solution in  $\text{C}_2\text{H}_5\text{Cl}$ .  
Stretched by applying cylinder of  
brass heated just above  $212^\circ$ , pulling  
tight & clamping. Seems good & tight.

Made and  
2/24/15

#10 - Brass Head - 2" External, 1 1/2" Internal  
diameters. Diaphragm (old some of  
Burman's). Test show cellulose acetate  
with probable camphor. .0035"  
Stretched by applying cylinder of brass  
heated above  $212^\circ$ , pulling tight  
and clamping. Seems good and  
tight.

#2A - Brass Head - 2" External, 1 1/2" Internal  
diameters. Diaphragm of Cellulose  
Acetate from solution in  $\text{C}_2\text{H}_5\text{Cl}$ .  
.0025". Stretched by applying  
heated cylinder of brass, above  
 $212^\circ$ , pulling tight & clamping.  
Seems to be good and tight.

#31 - Given Geo Nernst 9/17/15  
Tested 9/28/15. - Plots on lower  
chords - Heavier than standard.  
- Quality fair.

Made over  
9/1/15

#12 - Given Geo Nernst 9/17/15  
Tested 9/28/15. - Plots on  
lower chords - Quality good.  
2d test - Quality not as good as 4A.

Made over  
9/27/15  
See later

#30 - Given Geo Nernst 9/18/15  
Tested 9/28/15. - Plots on  
lower chords - little weaker than  
standard - Quality better than #31  
- Clean  
3rd test - Excellent Quality - Distinguishes  
with better than 4A - Sounds out  
pretty good.

Made over 9/28/15

9/17/15  
#31 - Brass Head - 2" External, 1 1/2" Internal  
diameters. Diaphragm of cellulose  
acetate from sol. in  $C_2H_5Cl$  -  
.0023". Stretched by applying brass  
cylinder heated above 215°, pulling  
tight & clamping. Seems good  
& tight.

#12 - Brass Head - 2" External - 1 1/2" Internal  
diameters. Diaphragm of cellulose  
acetate from solution in  $C_2H_5Cl$   
.002". Stretched by applying brass  
cylinder heated above 215°, pulling  
tight and clamping. Seems good  
& tight.

Made over  
9/27/15

#30 - Brass Head - 2" External - 1 1/2" Internal  
diameters. Diaphragm of cellulose  
acetate from solution in  $C_2H_5Cl$   
.0015". Stretched by applying  
brass cylinder heated above 212°,  
pulling tight and clamping.  
Seems good and tight.

Made over 9/28/15

Given Geomems 2/18/15  
 #4A - Tested 2/23/15 - Fairly hard - clear.  
 Blasts only slightly on low chords -  
 Quality good - clear.  
 1st test - Good quality - Stands out  
 well - bright.  
 2d test - Fairly hard - fine - good

#27 Given Geomems 2/18/15 -  
 Tested 2/23/15 - Not as hard as  
 standard - Blasts slightly on low  
 chords - Quality fair - fine.

Made over 2/1/15

2/17/15  
 #4A - Brass Head - 2" External - 1 1/2" Internal  
 Diameters, Diaphragm of .002"  
 Cellulose Acetate from solution  
 in  $C_2H_5Cl$ , stretched by applying  
 brass cylinders heated above 212°  
 pulling tight and clamping. Seems  
 good and tight.

#27 2/18/15  
 Brass Head - 2" External - 1 1/2" Internal  
 Diameters, Diaphragm of cellulose  
 acetate from solution in  $C_2H_5Cl$ ,  
 .002",  
 stretched by applying cylinders of  
 brass heated above 212°, pulling  
 tight and clamping. Seems good &  
 tight.

Made over 2/1/15

9/18/15.

Stripped film poured last afternoon.  
Seems O.K.

Saw about demonstrators. They  
not arrived at 10 am. Stinson only  
one to teach. This looks useless to  
take time on one.

Saw men about tests of recorders.

Got Records from Herder.

Made records of Vernon Dahart's  
voice. This man is nice and even  
but rather cheap of voice.

Taught Stinson for 15 min. Demonstrated  
rest of afternoon.

9/11/15.

Taught Hinson part of morning.  
Stretched Records.

Misses Rensen, Fates & Imgrid.  
Messrs. Duesinger (Violin) Bayle  
(Tenor) came up for recording  
experiment.

Used Jazmata, first regular,  
second with telephones & led by  
violin. Results inconclusive. Will  
put up to Mr. Edison to decide.

Made another set, third regular,  
fourth, with telephones led by  
violin. Results again not conclusive.  
In these songs were Miss Rensen  
as soprano, Miss Fates, alto, Hayes  
Tenor, Miss Imgrid, Piano, Mr.  
Duesinger - Violin.

Made a fourth record 'Carmena'  
as alone, regular, but with Bayle  
as Tenor and Hayes as Bass.

Will put records up to Mr. Edison  
to get instructions for next  
session.

#21. Given Gases 2/19/15.

#41 Given Gases 2/19/15.

2/19/15  
#21 - Regular Brass/Lead 2" ex. - 1 1/2" Int.  
Diameters. Diaphragm of cellulose  
acetate from solution in  $C_2H_5Cl$  + 90%  
stretched by applying brass cylinder  
heated above 212°, pulling and  
clamping. Seems not to have been  
pulled as tight as former ones and  
is not so tight. TRY \* SEE EFFECT.

2/19/15  
#41 - Regular Brass/Lead - 2" ex. - 1 1/2" Int.  
Diameters. Diaphragm of Cellulose  
acetate from solution in  $C_2H_5Cl$  + 90%  
stretched by applying brass cylinder  
heated to 212°, pulling tight  
clamping. Seems good and tight.



2/20/55.

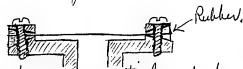
Got books, papers etc. from  
studio - Straightened them up.  
Got rid of accumulated memos  
etc.

Saw Walter Miller on  
stretched diaphragms. He  
reports that Peano record  
reported as good was  
made with stretched  
diaphragm.

Made up double quantity  
of aatyl cellulose in  
40oz  $\text{CH}_3\text{Cl}$  + 40oz  $\text{CH}_2\text{Cl}_2$  +  $\text{CO}$   
offered for film.

9/15/5.  
Took charge of new class of  
Disc Demonstrators.  
Repat.

Saw Mermel about testing out  
stretched diaphragms.  
Suggestion for stretched recorder.



As the screws are tightened the rubber  
gaskets will first press the diaphragm  
to cone shape and then cause it  
to be forced outward and stretch  
the diaphragm.

Stretched diaphragm in recorder

#32.

M.E. says  
try this

#32 Delivered to Geo. Norman 7/20/15.

Made and  
of cell/s

~~When smoked  
by anaesthetizing  
w/ gas being  
up.~~

8/22/15.  
#32 - Brass Head - 2" External - 1 1/2" Internal  
Diameters. Film of cellulose  
acetate from solution in 90%  
CH<sub>2</sub>Cl<sub>2</sub> + 10% (CH<sub>3</sub>)<sub>2</sub>CO. 002".  
Stretched by applying heated cylinders  
of brass, pulling tight and clamping.  
Seems good and tight.

9/28/15.  
Stripped film of last night.  
Looked after Demonstrator.  
Heated out the following passages  
which had been set up by the Messrs.

Uro-Telephone Horn in  
Grand Piano with top raised.  
Best for holding. Using  
Db. deep back 3 times followed  
by ascending chords of Db, struck  
fairly loud.

- Cylinder #1.
- #74 - Standard - Good quality -  
Plato only on low chords.
  - #7 - Quite weaker than #74. Plato  
on low chords - Fair quality.
  - #78 - Heels well. Messrs than standard  
Quality very fine

Cylinder #2.  
#31 - Blasts on low chords. Weaker  
than standard. Quality fair.

#30 - Blasts on low chords. ~~Quite~~  
weaker than standard. Quality  
better than #31 - clear & crisp.

Cylinder #3.  
#27 - Not as loud as standard. Blasts  
slightly on low chords. Quality  
fair. - Pull.

#4A - Fairly loud - clear - Blasts  
only very slightly on low  
notes. Quality good and  
clear.

#3 - Not as loud as standard.  
Blasts slightly on low chords. Quality  
fairer than 4A

Cylinder #4.  
#12 - Sensitive - Blasts on low  
chords - quality good.

#79 - Weak - Needs work - Quality not good.

#75 - Big tone - Blacks on low chords.

Cylinder #5.  
Made by playing piano register -  
Chopin, Nocturne in Eb - regular  
strength -

#74 (Standard) Loud but individual  
notes damped down.

#78 - Weak - individual notes damped.

#4A - Fairly loud - full - good.

Cylinder #6  
Piano force, a little louder than #5

#4A - Good quality - Slends out well -  
bright

#19 - Quality not so good as LA

#30 - Excellent quality - makes  
individual notes stand out.

Turned up dies for and made  
domes all afternoon -  $\frac{1}{2}$ " -  $\frac{7}{8}$ " -  $\frac{1}{8}$ ".

8/24/15.

Made run #29 Recorder.  
Ran about 2500 Demonstrations.

Found note in #29 as previously  
used had very bad place in cutting  
edge & turned it.



#29 - Tested 2/6/15 - Fan - Runs  
low chords together - quality  
fan

#32 - Tested 2/6/15  
Heads fine. Tone a trifle  
sharper than standard. Good  
definition. Rings

#3 - Tested 2/6/15 - sharper than  
standard. Rather dead - runs  
nice together.

2/6/15.  
#29 - Regular head 2" External - 1 1/2" Internal  
diameters. Film .002" of  
cellulose acetate from solution of  
C<sub>2</sub>H<sub>5</sub>Cl. Struck by applying heated  
cylinders of brass, just above 212° -  
pulling tight and clamping.  
Set up with dome 5/8" x .004" aluminum  
regular arm & 038 sapphire

#32 - Regular head - 2" External - 1 1/2" Internal  
diameters. Film .003" of  
cellulose acetate from solution of  
C<sub>2</sub>H<sub>5</sub>Cl. Struck by applying  
heated cylinders of brass just  
above 212° - pulling tight tight  
& clamping. Set up with dome  
5/8" x .004" aluminum, regular arm  
038 sapphire

#3 - Same as before but set  
up with dome 1/2" x .006"  
aluminum, regular arm &  
038 sapphire.

2/25/75

With Sure Demonstrations all  
day.

4/26/10

Met Desa. Demonstrators all morning.

Misses Remond, Ingrid, Fates  
ent.

Practiced on Quartette from  
Regalotto's

Made Quarts. & Quartette  
from Regalotto.

#1 Romano leading

#2 Romano leading

#3 N. lead.

Gave Ruth sketch for  
Barber Repts. & Regalotto.

Met Hammond - who  
authorized taking Des. Phons  
to St. Louis Pres. Church Newark,  
Olestin.

9/27/15.  
Examination of Diss Demonstrator  
all day.

---

#10 - Tested 9/6/15. Plants badly  
- Rotten - way back - dead

#27  
Tested 9/6/15 - Back in home  
muffled - weak & runs  
together.

9/27/15  
#12 - Brass head - 2" External - 1/2" Internal  
diameters. Diaphragm (same  
as #10 - 9/7/15) of cellulose acetate  
from solution in  $\text{C}_2\text{H}_5\text{Cl}$  - .004"  
thick. Stretched by applying  
brass cylinders heated above  
212°, pulling tight & clamping.  
Seems good and tight. Set up  
with 5/8" x .006" aluminum dome,  
regular arm 2.038" x .125" nickel

9/1/15  
#27 - Brass head - 2" External - 1/2" Internal  
diameters. Diaphragm of vinyl  
cellulose from solution in  $\text{C}_2\text{H}_5\text{Cl}$   
.0025" thick. Stretched by applying  
brass cylinders heated above  
212°, pulling tight and clamping.  
Seems good and tight. Set up  
with 5/8" x .006" aluminum dome,  
regular arm 2.038" x .125" Baryphire

#10 - Tested 9/6/15. Blasts badly  
- Rotten - way back - dead

#27  
Tested 9/6/15 - Back in horn  
muffled - weak & runs  
together.

9/27/15  
#12 - Brass head - 2" External - 1/2" Internal  
diameters. Diaphragm (same  
as #12 - 9/7/15) of cellulose acetate  
from solution in C<sub>2</sub>H<sub>5</sub>Cl - .004"  
thick. Struck by applying  
brass cylinders heated above  
212°, pulling tight & clamping.  
Seems good and tight. Set up  
with 5/8" x .006" aluminum dome,  
regular arm 3/8" x .125" needle

9/1/15  
#27 - Brass head - 2" External - 1/2" Internal  
diameters. Diaphragm of Cetyl  
Cellulose from solution in C<sub>2</sub>H<sub>5</sub>Cl  
.0025" thick. Struck by applying  
brass cylinders heated above  
212°, pulling tight and clamping.  
Seems good and tight. Set up  
with 5/8" x .006" aluminum dome,  
regular arm 3/8" x .125" sapphire

#1 - Testes 3/6/5 -  
 Blasts slightly on low chord.  
 spec. Slightly fan

#31 - Testes 3/6/5 -

Blasts from parts touching.  
 natural quality - but back in  
 horn - high notes plucky.

Late (note raised) Blasts  
 only on lower notes. Quality  
 natural but back in horn - does  
 not stand out, high notes plucky  
 like banjo.

3/1/5 -

#2 - Brass head. 2" External - 1 1/2" Internal  
 diameters. Diaphragm (same as 7/6/5)  
 of acetyl cellulose from solution  $C_2H_2Cl_4$   
 .003" thick. Stretched by laying on  
 brass cylinder heated above 212°,  
 tightening & clamping. Seems good &  
 tight. Set up with dome  $5/8 \times .006$   
 aluminum, regular arm. .038  $\times$  .125"  
 sapphire.

#31 - Brass Head - 2" External - 1 1/2" Internal  
 diameters. Diaphragm (same as 7/7/5)  
 of cellulose acetate from solution  
 of  $C_2H_2Cl_4$  .0023". Stretched by  
 applying brass cylinder heated  
 above 212° pulling tight & clamping.  
 Seems good and tight.  
 Set up with aluminum dome  
 $5/8 \times .006$ " - sapphire .038  $\times$  .125"  
 regular arm.

Tested 3/6/15 - Heads well - tone more  
full than 32 - does not ring  
quite so much but tone is  
natural - little plummy - louder  
than 74 (Standard).

Tested 3/2/15

Quality fair.

Does not beat with horns 9 & 10.  
Somewhat muffled and like  
other acetate cellulose recorders  
lacks definition.

Tested 3/6/15

Heads fine - single notes - beats  
on low chords - quality little  
plummy fair.

3/1/15  
#28. Brass Head. 2" External. 1 1/2" Internal  
diameters. Diaphragm (Same as 74/15)  
of aluminum, left by German  
probably cellulose acetate camphor  
.004" thick. Struck by putting  
on brass cylinder heated below  
212°, tightening & clamping.  
Seems good and tight.  
Set up with aluminum dome  
5/8" x .006" - Regular arm -  
Sapphire .038" x .125"

3/2/15  
#33. Special adjustable head as 3/2/15  
with triangular rubber gaskets.  
With diaphragm of cellulose  
acetate from solution in C<sub>2</sub>H<sub>4</sub>  
Cl<sub>4</sub> - .0025" thick. Struck  
by tightening screws of  
clamping ring. Seems good  
& tight.  
Set up with aluminum  
dome 5/8" x .006" - regular arm  
Sapphire .038" x .125"



8/1/15.

Put up recorders as shown.  
Graded examination papers.  
Put diaphragm in & rubber gasket  
adjustable stretched peardin

3/4/15.  
Finished grading Diamond Disc  
Examination papers.

Put up adjustable recorder &  
tested out on piano recording  
with horns 10 & 9 respectively.

This recorder seems to hold piano  
with both horns when close in  
even on heavy chords.

Tightening up the diaphragm  
does not seem to change its  
characteristics.

8/2/15.  
Tested out #33 Recorder. This  
gives with piano fair quality but  
is still somewhat muffled and lacks  
definition.

Made up new domes and arms.

Looked over score of "Quarrelle" from  
Rigoletto - marked out portions where  
emphasized as melody parts on  
recording.

Report from Walter Miller on recorders  
sent over as follows

#26 - Too thin. Not as good as #67.

#25 - Explosive Quack

#67 - Standard -

#67 - Standard

#23 - Muffled & Back

#24 - Too weak.

Got heads #'s 34 & 35.

Made over 3/4/5

Tested 3/4/5. Blasts on heavy chords with horn #9. Is too full-bulby and muffled.

It is evident that this material is too thin & not quick enough of response.

Made over 3/4/5

Tested 3/4/5.

① - Works pians with all horns and any way can be played. Excellent definition. Quality metallic.

② - Works everything. Quality good. Little weak. Excellent definition.

③ - Works everything. Quality good. Excellent definition.

3/4/5.

#34 - Special adjustable head as 3/25/5 with triangular rubber gaskets. With diaphragm of acetyl cellulose .001" from solution in  $C_2H_5Cl$ . Stretched by tightening screws of clamping ring. Has little resistance.

Set up with aluminum dome .038" x .006" - regular arm, Sapphire .038" x .125"

#35 - Special adjustable head as 3/25/5 - with triangular sectioned rubber gaskets. With diaphragm of hard bronze .0025" thick. Stretched by tightening clamping rings. Is very tight & springy.

① Same disc 3/1006

Set up ① regular arm - no dome or center piece. Sapphire .038" x .125".

② With disc of aluminum center .038" x .006" & same arm & sapphire as above.

Made over 3/4/5

8/4/15.  
Set up and test #34, 35  
with results as shown.

CORIOUS Fare up #34. Found  
edges of .001 diaphragm where rubber  
had been in contact - crushed.

#34- Very sharp & tin-panny.  
Quality Rotten.

#34-① Head as well - somewhat sharp.

Test 3/6/5 - Heads fine on all - quality good - Even shot  
definition. Found as #74. Little sharper

- ② Rifle more full
- ③ Becomes little more full
- ④ Becomes little more full

3/6/5 - Putting gas to  
pieces - too fine - heads in  
heavy clouds.

#35- ① On first trial piston  
found bad needle.  
On second trial - good  
general quality but does not  
carry ring of notes - sounds  
dead.

② Runs up a little &  
becomes more natural.

3/1/5-  
#34- Head same as before. Put up  
with diaphragm of Uraso, .0015".  
Seems very tight. Regular arm. No  
dome. .038 x 125 Sapphire.

#34- Head same as before. Put up  
with diaphragm of mica, .0015": ①

- ① Stretched Tight
- ② Stretched not quite so tight
- ③ Loaded with wax
- ④ Loaded more wax

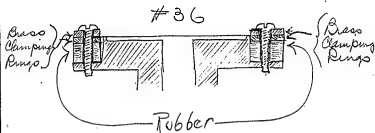
#35- 3/5/5-  
Same Head as before.  
Fine diaphragm, .002". Loaded.  
Regular arm & needle.

- ① Stretched medium tight
- ② " Tighter.

#36 - Quality good. Fairly  
loud. Ring fair.  
Nothing remarkable.

test 2/6/15. full - good but fair - quality  
excellent - rattles & bleats a little.  
(pushed together). Stopped all bleats & out down  
volume little on soft playing.

#36 Head inside as per sketch  
on following page to carry out  
Mr. E's idea of only metal  
touching vibrating diaphragm.  
Diaphragm .0528" of acetyl  
cellulose from solution in C. H. Cl.  
Regular arm & needle.  
Some 1/8" x .004" aluminum.



3/5/5.

Set up and tested out #s 35  
& 36.

Found that #35 was rotten  
at first - weak and tin-  
panny. Mike showed a very  
poor needle. Changed needle  
and found results remarkably  
different. New needle showed  
excellent in Mike & entirely  
changed the record.

This emphasizes the attention  
which should be paid to the  
saphires as it is evident  
that at least 50% of the record  
depends on this part of the  
recorder.

<sup>except</sup> Invertebrate came. <sup>who</sup> Muriel Bates has  
laryngitis. No work done except  
two short records made.



3/6/15.

Set up machine, understand  
Tinsleyson to help and tested out  
the following records

Cylinder #1

#3 Sharper than standard - Rather Dead -  
puns notes together.

#74 Standard - full - natural -  
differentiate stimuli.

Cylinder #2

#29 - Fair - puns less chords together -  
Quality fair.

#27 - Back in legs - muffled - weak  
puns together.

#74 - Standard

Cylinder #3 -  
#74 - Standard

#31 - Plots from neck arm touching  
back arm. Natural quality, but  
back in horn. High notes, plunky.

#31 - (Pucker raises sprits feed) - Plots  
on lower notes

Cylinder #4  
#8 - Plots slightly on low chords &  
tune, quality fair,

#12 - Plots badly - Rotten - Tone  
way back in horn - Dead

#74 - Standard

Cylinder #5.  
#74 - Standard

#32 - Thes fine. Tone a trifle sharper  
than 74 but good definition. Rings.

#28 - Thes more fuller than 32 - does not  
ring quite so well but tone is natural though  
low plunky.

Cylinder #6  
#33 - Sounds fine on single notes.  
Blends ok low chords. Indistinct  
little plunkety-fair.

#34 - Sounds fine on all. Quality good.  
Excellent definition. No loud ak

#74 - Little sharper than standard.

#74 - Standard.

Cylinder #7  
#74 - Standard.

#35 - Rattle - goes to pieces - too full.  
accentuates heavy bass notes.  
Blends on low chords. Break  
in horn. Responds to C.

Cylinder #8  
#74 - Standard

#36 - Full - good - sounds fair.  
Quality excellent - Rattles  
& blends notes a little.

① Same surface. Run few notes together. Quality excellent

② Not quite so much surface as ①. Smoothed out & all notes differentiated.

③ As 2 but triple cleaned shell.

Cylinder # 9  
# 36 - (pulled tighter) This stopped the blast entirely, but acts lower volume on light playing. Record is less sensitive.

Later. Received  $1\frac{1}{4}$ " triangular rubber gasket head & set up using diaphragm of acetyl cellulose film solution in  $C_2H_2$  Cl<sub>4</sub> .0025" thick.

Set up:

① Regular arm - fairly large foot firm wared to diaphragm.

②  $\frac{1}{2}$ " dome aluminum .004" Regular arm etc.

③ Same as above but new arm sapphire -

3/8/15.

Had Finlayson fix stop on recording machine so that sliding slide arm would not knock off chain. Also put switch on recording machine for separate control of microscope lamp.

Tested out recorders with Geo. Hervey & Hayes as follows.

Cylinder #1

- #74 - Standard
- #36 - Louder than standard - little thinner - notes slightly
- #87 - Not as loud as 36 - trifle sharper than standard - little metallic.

Cylinder #2.

- #74 - Standard.
- #32 - Louder than standard - notes on high notes - back in horn - thinner than standard
- #41 - Big full tone - back well not as loud as 74 - very full little plunkier - back in horn

Cylinder #3

#74 - Standard.

#34 - Not loud as standard. Full -  
note firm - rattles - little  
sharper than #74.

#4A - Not as loud as standard. Little  
back in horn. Quality very  
good

Cylinder #4.

#74

#41 - (Needle raised) Very full -  
little back in horn - slightly  
muffled - good tone.

#88 Full weak & slightly back  
in horn - full but not as  
sweet as #74.

Got new 1 1/4" head. Set up  
with .0015" aluminum diaphragm.  
Tuned. Metallic, sharp, unpleasant,  
tin panny, thin.

Set up 2" head (#33) with  
.0015" aluminum diaphragm -  
Same quality as above -  
Set up with .003" aluminum

diaphragm. Still too thin but  
better than unit, 0041.

- 3/9/15.

Loaded up #37 with extra wax on the dome. This makes it fuller. It is louder than standard & seems to make the melody stand out more - think it does not carry the ring so long. Differentiates well.

Made up #38 - new  $1/16$ " brass head. with .002" mica & tried out. This is loud & differentiates well but rattles slightly.



#37-

Good & loud. Stands out of horn - trifle sharper than standard.

- ① Makes it fuller. Definition excellent. Just a trifle of rattling tone good. Quality good. Louder than standard. Stands out of horn fine. Geo. Wernow says best stretched because he's heard

#38 - Louder than standard.

Sensitive. Stands out well but little sharp & rattles lightly.

- ② Makes little more full. Still not as natural as #37.

Made and 3/10/15

3/9/15

#37. Brass head  $1\frac{1}{4}$ " external,  $1\frac{1}{2}$ " internal diameters. Triangular section rubber gaskets to stretch.

Set up with acetyl cellulose diaphragm from solution in  $\text{C}_2\text{H}_2\text{Cl}_4$  - 0025".

Set up with aluminum dome  $\frac{1}{2}$ " x .001" - regular arm & sapphire, 038" x .125".

See 3/10/15

- ② Added extra weight on dome

#38 - Brass head -  $1\frac{1}{2}$ " external,  $1\frac{1}{4}$ " internal diameters. Triangular section rubber gaskets to stretch.

Set up with mica diaphragm .002" thick.

Regular arm with large feet. Regular sapphire, 038" x .125".

- ② Added extra weights on feet

Made over  
3/11/15

#39 Loud, clean, firm,  
stands out well, quality  
little sharper than standard  
but comes out clean.

#38 Tunes 3/11/15. Rays singing.

① Loud but muffled &  
squeaks.

② (3/13/15) "Very like #1 -  
fuller & more sensitive  
than #74, little more  
sensitive than #41."

③ 3/13/15 - Louder & more  
sensitive than #74 -  
little sharper, reacts  
sharply on loud notes.

3/9/15

#39 - Brass head,  $1\frac{1}{2}$ " external,  $1\frac{1}{4}$ " internal  
diameters, triangular section  
rubber gaskets to stretch.  
Diaphragm of stock celluloid  
.0065" thick - screws just tightens  
- not stretched.

Regular arm with medium  
felt well waxed to diaphragm.  
Sapphire .038" x .125".

3/10/15

#38 - Brass head:  $1\frac{1}{2}$ " external,  $1\frac{1}{4}$ " int.  
diameters, triangular section  
rubber gaskets to stretch.  
Diaphragm of acetate cellulose  
from collection B. H. C. L., .0015"  
brushed pattern tight.

① Regular arm with rather large  
felt well waxed to diaphragm.  
Sapphire .038" x .125".

② Made over 3/17/15 with  $1\frac{1}{2}$ " .006  
flat aluminum disc & same  
needle arm.

③ Changed above to 3/16" .006"  
aluminum disc. Same needle  
arm.

Made over  
9/15/15

#40 -

① Blasts - too full - blubbery.

② Very loud. Stands out of horn better & farther than any records I ever heard. Clear, distinct crisp - differentiates excellently. Is a little thin.

③ Makes it full (very) & rattle.

④ Cuts down volume & crispness & some of the sand out of the horn quality but makes it natural. Just a little sharper.

⑤ Makes it a little more full.

⑥ Not 9/15 Hayes singing. Stands out fine. Power, Clear, Crisp. Quality good. - Little sharper than standard -

Shps = Sharp. Then 74 - does not ring out. Shows harmonics.

9/15/15.  
#40 - Brass head 1 1/2" external, 1" internal diameters, triangular section rubber gaskets to stretch. Diaphragm of acetyl cellulose given solution Q. & A. Oct. 0015" thick.

① Regular arm with rather large foot, not stretched tight.

② Same stretched tight.

③ Added piece of solder wire to upright part of foot.

④ Put on aluminum disc 1/2" x 0.06".

⑤ Added wax to disc to increase weight.

Made over 9/15/15

8/10/15.

Attended meeting with McChesney  
to see about making Alex. Graham  
Bell picture.

Put up #538 & 40 penders.  
Pendered party of Miss Rensen  
Tested out #40 on Hayco.

Came back at night & made  
further tests on #40.

#39 Tester 3/11/15-

① Piano arm / speaking.

Quality good but very weak.

② - Notes ringing  
quite louder than 1 - still weak.  
Notes says "weak & fair".

3/11/15.

#39 - Head Brass  $1\frac{3}{4}$ " ext.  $1\frac{1}{4}$ " internal diameter. With aluminum disc over open part of diaphragm as suggested by M. Stutchison. Diaphragm of acetyl cellulose from C. & L. L. - 0003 Thick. Regular .0382/15" gap phase.

① - With dome  $1/8 \times .006$  - to vertical arm waxed to neck arm.

② - Made up combined fast & vertical - waxed to neck arm.

8/11/15  
Made up #39. Took to X  
depot. Resid out following:

Tested Hayes singing Sabat  
notes in #42.

- ① #40.  
Stand out fine. Loud. Clear.  
Crisp. Quality good - little sharper  
than standard. Hayes says good.
- ② #39<sup>2</sup> near - quality good.  
looks even.
- ③ #38 - Loud but muffled  
<sup>& squeaky</sup>
- ④ #74 - Standard.
- ⑤ #37 - Louder than standard  
Clear, crisp, stand out well.  
little sharper than standard.  
Should make commercial  
records.

#41 - Tested 3/12/15.

① Fuller more sensitive than #74. Shows piano hammer blow on string on striking note.

② - 3/13/15 - less sensitive - does not show hammer blow of piano - does not strike no. ① - good quality.

Made over 9/5/15

#42 - Tested 3/13/15.

Not as loud as #74. Better sharpw. Needs better.

3/12/15 - (transducer rubber gasket)  
#41 - Brass head -  $1\frac{1}{4}$ " external -  $1\frac{1}{2}$ " internal diameters. Diaphragm of acetyl cellulose from solution in  $C_2H_2Cl_4$  - .002" thick.

① Set up with  $\frac{1}{2}$ " x .006" aluminum disc at center, regular arm, sapphire .038" x  $1\frac{1}{2}$ ".  
② Set up with  $\frac{1}{4}$ " x .006" aluminum disc at center, regular arm. Sapphire .038" x  $1\frac{1}{2}$ ".

3/12/15 -  
#42 - Brass head -  $1\frac{1}{4}$ " ext. -  $1\frac{1}{2}$ " internal diameters. Diaphragm of mica .001" thick. Set up with  $\frac{1}{2}$ " x .006" aluminum disc at center, regular arm, sapphire .038" x  $1\frac{1}{2}$ ".

N  
- 3/2/10 -

Put up recorder #41-

Misses Remond, Tiller - Impres came  
& tried over "Duetto" from Pigoletto  
Romano - lead.

Rec'd I - #9 - 2 min recorder  
(Gottwein) - Good - full - clear

#105 - too pulsating -  
rattles - back in horn  
Rec'd #2 - Good - balance fair -  
quality good. Keep only  
fairly together

Rec'd #3 - not noticeably different  
except that soprano was  
flatter twice but better  
more even voice -

Rec'd #4 - 2 min recorder #74 -  
recording & balance fine. Not  
very well together.

Rec #5 - Campan #37 & #74  
recorders. #37 too pulsating  
muffled - does not  
differentiate well. Not  
commercial as hoped. (10/12)



8/18/15-

Negro quartette recorded.  
Set up and tested #42

Tested Reaplers with piano.  
Tested first #42 with #9 horn.  
Found that it responded to  
24. Raised horn & this did  
not occur. Changed to #7  
Loud & lowered. Did not occur.  
Tested following records:

- #42 - Not as loud as 74 - feels  
fine - little sharper
- #40 - Sharper than 74 does not  
ring. Shows hammer  
blows.
- #37 - More sensitive than #74  
- blasts - full - but shuts  
off notes
- #38 - Very like #41 but little more  
sensitive. Shows hammer  
blows of piano, full.

#41 - Fuller more sensitive than  
#74 - shows hammer blows  
of piano.

Made #41 up again taking  
off  $\frac{1}{2}$ " disc & re-peening  
with  $\frac{3}{4}$ "  
Makes it feel much better -  
does not show hammer  
blow of piano but shows out  
more. Slightly fuller than  
#74.

#38 Put  $\frac{3}{4}$ " x .006" disc on #38.  
Comes out good & loud, fuller  
than #74 - blasts a trifle on  
lower heavy notes.

#37 - Put  $\frac{3}{4}$ " x .006" aluminum  
disc on this ~~disc~~ piano. Is  
still more sensitive & louder  
than #74 though a trifle sharper.  
Blasts a bit on lower notes.

#37 - Put on  $\frac{1}{8}$ " x .006" aluminum disc.  
Low, clear, full, good quality,  
little sharper than #74 but does  
not blast or show hammer blows  
of piano.

#37- Tests 3/13/15

- ① More sensitive than #74 and louder. Triple sharp. Blasts just a trifle on loud notes. Stands out of horn better than 74.
- ② About as loud as 74. Stands out well. Just a trifle sharper & clearer. Needs better on all notes.
- ③ Voice good & loud close in. Can be heard at 5 ft. Very weak at 12 & 15-18 ft.
- ④ With Kuntzstone Horn, fairly loud and distinct at 15-18 ft away.
- ④ Tests 3/17/15. Notes singing. Louder than standard. Triple sharper, Needs more. Piano good.

3/13/15

#37- Brass Regd-1 1/4" external-1 1/4" int. diameters. Triangular section rubber gaskets to Serket. Set up with acetyl cellulose diaphragm from solution Co. H. Cl 4 - .0025".

- ① Set up with aluminum disc 3/4" x .006" - regular sapphire arm
- ② Set up with aluminum disc 7/8" x .006" - regular sapphire arm

③ Same as above

④ Same as above

#40 Tester 3/13/15:

- ① - Loud - stands out fine but is sharper & more punched than #74 or #37-②.
- ② Not as good as ① - Very much weaker - dingy notes - stand out fair but notes not clear - rather thin & very punched
- ③ Louder than ② but rather not good

3/13/15.

#40 - Brass Head -  $\frac{1}{2}$ " External, 1" Internal  
Diameters, triangular section  
pulsar gasbits & stretch diaphragm.  
Diaphragm of acetyl cellulose  
from solution of C<sub>2</sub>H<sub>5</sub>OH - 0015" thick.

- ① Aluminum disc  $\frac{7}{8}$ "  $\times$  .006", regular arm & sapphire.
- ② Aluminum disc  $\frac{7}{8}$ "  $\times$  .004", regular arm & sapphire.
- ③ Lift above disc on and added a concentric one  $\frac{7}{8}$ "  $\times$  .008" same arm & sapphire.

3/15/15-

Note up report.

Timberman on getting L min  
part of recording machine to work

Set up Record #41

\*Note  
3/15/15  
#41 Tested night 3/15/15-  
Sharper than standard. Not  
as loud. Tuffle back in horn.  
Holds better.

\*Note  
3/15/15  
#37 Little sharper than  
standard. Not quite  
as loud. Holds better.  
Not quite as sharp as #41.

\*Note  
3/15/15  
#38 Has a jump after notes. Note  
sharper than #74

#36 - Tuffle sharper than  
standard - not quite as  
loud - holds as well or  
better.

#41 - Brass head - 1 1/2" external, 1 1/2" int  
diameters - triangular piston  
puffer gaskets. Diaphragm  
of acetyl cellulose from  
solution in C<sub>2</sub>H<sub>2</sub> Cl<sub>2</sub> .002"  
thick.

① Set up with 7" x .0075" aluminum  
disc - regular arm & pappire.

#37 - same as 3/13/15

#38 - Same as 3/10/15 except that  
7/8" x .006" aluminum disc put  
on.

#36 - Same as 3/11/15 except that  
1" x .006" aluminum disc used  
on center.  
Made cover for #39

#42 - Powder than 74 - Just a little sharper - Does not hold quite as well - Little fuller than #38 - rattles just a trifle.

#38 - Powder on treble - not so loud on bass as 74 - speeds better - is a trifle thinner - differentiates notes fine - does not bleed in rattle.

② Not quite as loud as ① - takes away all tendency to rattle & runs out excellently. Still just a trifle thinner than standard. Well held for further trials.

3/10/15.  
#42 - Brass head  $1\frac{3}{4}$ " ext,  $1\frac{1}{4}$ " int. diameters, triangular section pulley gaskets to plate.  
Diaphragm of aluminum .0015" thick, made very soft by heating & cooling rapidly.  
① Regular arm with fairly soft - .038" x .125" sapphire.  
② Added  $\frac{5}{16}$ " x .006" disc under above arm.

#38. Brass head -  $1\frac{3}{4}$ " ext,  $1\frac{1}{4}$ " int. diameters, triangular section pulley gaskets to stretch.  
① Diaphragm of aluminum .0015" made very soft by heating & cooling rapidly. Regular arm with large feet - .038" x .125" sapphire.  
② Added  $\frac{5}{16}$ " x .004" aluminum dome under foot, otherwise same

3/17/15 (very sharp or thin - pyrexia)  
Powder than standard. (same sharp & pyrexia)

3/16

3/16/17.

Saw Pammel & Nelson about  
Graham Bell picture on the 27th.  
Part of morning and afternoon  
with them.

Made up Bandura's 2 aut. & 8.  
Saw about getting 90 ft 4 mm  
lead screw on recording machine.  
The lead screws used so far have  
mostly drunken threads & so had  
that this machine can not be  
used.

Unable to test because recording  
machine was torn up.

Report on action of discs  
and domes on record.

9/17/14

See not Book



[ITEM(S) FOUND IN BOOK]

Things I can't find  
 missing from the  
 record. I think  
 I have found  
 some of the  
 things I  
 thought I  
 had lost.  
 I think I  
 have found  
 some of the  
 things I  
 thought I  
 had lost.  
 I think I  
 have found  
 some of the  
 things I  
 thought I  
 had lost.

little enclosure  
 obliterated pen ders.

Made a new one with  
 diaphragms of white celluloid, 0050  
 purchased from The Celluloid Co.  
 stretched it by simultaneously freezing  
 the head and warming the diaphragm  
 clamping & allowing both to come  
 to normal temperature.

This gives a recorder which  
 is too sharp and thin.

As this is exactly the  
 reverse of previous reports where  
 the recorders were all too full  
 & tubby it is encouraging in  
 that we have both extremes  
 and can try for a mean.

[ITEM(S) FOUND IN BOOK]

Perhaps the diaphragms I have made are from film used green, that is, not entirely cured in which the solvent has not entirely dried out, which made them dead and not quick of response. Do you think it would be worth while to go out and attempt to purchase some various thickness of stock from the Celluloid Co and the Arlington Co. Such stock is probably better cured than that I could make here.

Am Kennedy

2/18/15.

[ITEM(S) FOUND IN BOOK]

① #4 - With Phones -

② #3 - without "

③ #2 - With Phones

④ #1 - without "

[ITEM(S) FOUND IN BOOK]

|     |     |            |
|-----|-----|------------|
| 1 = | 30  |            |
| 2   | 75- |            |
| 3   | 70  | best place |
| 4   | 70  |            |

[ITEM(S) FOUND IN BOOK]

26 - too thin notes good  
as # 67

25 - explosive squeak

67

67

23 - muffled & back

24 too weak -

~~CONFIDENTIAL~~

- #0 - Set up Mirror (pans, record book)  
#1 - Set up by Her. Man. - But Rec. (S. #3)  
Ramp back #1  
Gamma - #1  
Dennis Good in  
law. Hand 7 m. deep. T. 10  
m. high. 10 m. wide. 10 m. deep.  
#2 - Set up 4 m. -  
#3 - Put Set up -  
#4 - Set up -  
#5 - Set up -

**Notebook Series -- Notebooks by Edison and Other Experimenters  
Recorder and Recording Experiments -- A. M. Kennedy Books  
Notebook, N-15-03-17**

This notebook is a continuation of N-14-09-21. It was used by Absalom M. Kennedy during March-June 1915 as a daily record of experiments and tests with phonograph recorders and reproducers. The daily record is continued in N-15-06-04.2. The tests involve various instruments and parts of the recording machines and variations in the positions of voices, instruments, and recording horns. Also included are tests of machines to reproduce cylinder records from disc master recordings. The entries also describe other work by Kennedy, including his collaboration with Leonard W. McChesney and other employees in the production of "The Birth of the Telephone," a kinetophone film about Alexander Graham Bell. Kennedy's notes often mention Edison's own involvement in the phonograph experiments, including his comments, suggestions, and further instructions about particular recordings or masters. Other individuals involved in the work include Clarence B. Hayes, Walter H. Miller, John F. Ott, and an experimenter named Taylor (probably Henry A. Taylor). The front cover is labeled "Recording Experiments Book #2 from March 17-1915 to June 4, 1915" in ink and "Kennedy" in pencil. The pages are unnumbered. Approximately 150 pages have been used.

3/7/15

- ① #40 Louder than #74 - sharper and not so dull, sweet and natural. Blasts or rather rattles - sounds pinched. Stands out of horn fine.
- ② #39 - Not as loud as #74 - Sharper - back in horn - quality fair - holds well.

3/7/15.

- ① Made up #40 - same as 3/10/15 - back 1 but with aluminum disc, waxed to open side of head portion being cut away to allow sapphire arm to project through.
- ② Hammered out new cap for #39 to allow larger space between diaphragm & cap.

Made up #43 recorder as per next page as an example of small diaphragm. This unit test extreme smallness of diaphragm.

Learned from #43 that the method of fastening the arm makes an absolutely difference with a recorder. When the arm was fastened to the ring was too weak - when bent down & waxed to diaphragm was too loud.



#43- ① Sensitive quality but  
much too weak. Evidently  
exerting such a short arm  
has a damping action on  
vibration.

② - First trial - so sensitive  
impossible to get away  
from surface - heard chatter  
badly.

Second trial tightening up.  
Very loud - bleasty. Louder  
than regular trans. Thin  
& sharp. - Rattles but musical  
rattle.

③ - Neaker than 2. Thin  
& sharp - rattles.

9/17/15.  
#43- Brass Head 1 1/2" Ext. 7/8" int  
diameters with triangular  
section pulber gaskets to  
stretch.

Diaphragm of acetyl cellulose  
+ camphor .00075".

① Regular arm & scaphra  
arm raised to clamping ring.

② Arm bent down & raised  
to diaphragm.

③ 5/8" x .006" aluminum disc  
on diaphragm.

3/17/14.

Tested out the following  
members, Hayes singing "Satan  
Meter" - Miss Ingred accompanying  
on piano -

Cylinder I

#74 - Standard.

#37 - Louder than standard. Triple  
sharp - Notes well - piano  
good.

Cylinder II

#74 - Standard

#41 - Sharp - Squeaks - Louder  
than standard - Stands out.

Cylinder III

#38 - Very sharp & squeaky  
louder than standard

#42 - Piano sharp and piercing.  
Big - Loud - Free - Muffled  
Blasts - Does not hold -  
Piano blasts badly -  
Shows interference between  
piano and voice.

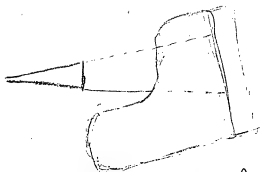
- Cylindripoda* IV
- #40 - Head - thin - Hairs  
well - pinched - Should be  
tried for sensibility x  
manipulated
- #39 - Back in horn - Little  
sharp - tender than #41  
Hairs well.

3/18/15.

Inspected Powell's work on  
Rehery for Bell Picture.

Worked on recorder #43. This  
little recorder gets me. Punctured  
diaphragm last night so put  
on a new one this morning.  
But regular sapphire effect on  
with arm cut off. Blows from  
front by 2 threads prevent arm  
working free & aft with strain  
Such a mount has very  
quite resistance to vibration  
yet this recorder is very low  
not at all like when mounted  
with bent arm to diaphragm  
last night.

Experimented with mic.  
Succeeded to find best position  
for piano to make record.  
Tried various positions  
with various change of  
horn position and at  
her suggestion found



above position with horn  
in horizontal line slightly  
above middle tones of piano  
(so as not to include regular  
bass strings) and is vertically  
above focus with the strings.

The difference in positions  
was very marked. In the  
former position there was  
a great deal of interference  
& muddling of notes and  
the work was not clean  
cut. In the new position  
the balance was very much  
better and the notes stood  
out clear & clean.

3/19/50

Inspect Remell work for  
Tacking Picture - Saw machine  
on same.

Reading machine still going  
bad. Difficult to locate trouble  
causing drunken thread.

Trucks of following records  
Miss Impulse at Riano - Prologue  
To Pagliacci -

#74 - Standard.

#37 - Weaker than standard.  
Does not ring as long. Muffled.  
Back in horn.

#42 - Louder than standard.  
Sharper. Does better. Not  
as full - Does not hold  
ring as long.

#39 - Weak - no volume.  
Plucky - does not ring.

#41 - Thinner than standard.  
Does better - Not as loud.  
Does not ring especially  
on high notes.

① Neck. Too weak to  
judge. Apparently thin  
splinty.

#36 - Round. Sharp though not  
as thin as #41. Does not hold  
as well as #41 though about  
as well as #74.

#40 - Thin. Round. Sharp.  
Holds fine. Stands out  
~~differentiating well~~ espe-  
cially on high notes.

#38 - Rounder than Standard.  
Stands out well - Does not  
hold - Thinner than  
Standard.

2/20/15-

#42 -

Brass head -  $1\frac{1}{2}$ " external.  $\frac{3}{4}$ " internal  
diameters. Triangular section  
rubber gaskets to stretch.  
Diaphragm seal of Cellulose  
camphor, .00075" thick.

① Set up with  $3\frac{1}{2}$ " high di.  
dome & arm supports from  
front

Set up #13 with arm/  
supporter from front. showed  
very weak.  
Set up #40 with similar  
front supporter arms but  
with disc & foot. This  
showed up also weak.  
Set up #40 with regular  
arm & disc. Still weak.

Marked on Recording  
machine which was bad.

Marked on cap for disc  
reproduction -  
1st 3 discs to make  
regular diaphragm, these  
discs having different  
size holes in center. That  
having the smallest hole  
made the reproduction ~~weaker~~  
smaller than standard. Those  
having larger holes affected  
the reproduction less so the  
size of the holes increased.



3/22/15.  
To Newark to get furniture  
for Parkin Picture. Two  
trips required most of the  
day. Went also to  
Automobile Raceway.  
Looked after General  
etc. of Parkin Picture.

Night. Built up #48  
pocket, with new neegee  
arm. This record is too  
sensitive starts on  
even low (not loud) piano  
notes, particularly in the  
middle register. So not  
responsive to the upper  
register.

8/28/15-

Came to Studio & saw  
to setting up furniture  
etc. for 1909 picture.

Started off salesmen's  
class. These men are not  
interested in this work  
and it is going to be hard  
to get them into it.

Might. Set up #43 with  
new arm



arranged to support the  
sapphire and not touch  
ring to damp action.

This is much too sensitive  
and chatters or sings when  
record is revolved.

When waxed even just a  
touch at bottom to ring becomes  
very-(too) low in quantity -  
not loud enough.

#43 - 1st trial Needle too flat & back of arm not secure. Needle chattered badly.

2d Trial - arm bent so as to give better angle to needle & back of arm made more secure.

Rearr. plans out fine but quality is peculiar - makes piano sound like a guitar.

#44 - ① Whistles so badly that it can not be used.

- ② Not as loud as 74 - does not ring as well - Starts on middle Register notes.

③ Fine - apparently as loud, practically as full - holds as well & compares favorably with 74.

3/24/15.

#43 - Brass Head 1 1/4" External - 9/16" internal diameters, triangular section pulber gaskets. Diaphragm of cellulose acetate from solution 1 part C<sub>2</sub>H<sub>5</sub>Cl<sub>3</sub> 2 1/2 part C<sub>2</sub>H<sub>5</sub>Cl<sub>4</sub>. Set up with regular arm bent down to meet diaphragm.

#44 - Need. - Diaphragm stretched over metal edge. 1 1/2" diam. Diaphragm of cellulose acetate from solution of 1 part C<sub>2</sub>H<sub>5</sub>Cl<sub>3</sub> 1 part C<sub>2</sub>H<sub>5</sub>Cl<sub>4</sub> .002" thick.

- Set up
- ① Regular arm, lightly fastened to diaphragm at edge.
  - ② More firmly fastened at edge and on diaphragm.
  - ③ 7/8" x .006" disc. put on & remounted.

Oct 15.  
Looked after Wilson's photograph  
of taking picture.  
Greeted up members at 4:15  
& tested preliminary on H.

8/25/15.  
Marked #74 over. Rough  
cut at first. Turned  
sapphire & reset arm -  
Seems good compares  
favorably with #74.  
Tried out again with Miss  
Imprud. Resolux seems to  
hold better than #74. Stands  
out of horn better - is about  
as loud - quality fairly near  
the same. Held for  
further test.

At studio to get set up  
for picture. Gibson jumps  
around with camera too much  
and does not attend to  
the larger things in lighting.

Next made up & tested  
out recorder #46. Is thinner  
& sharper than standard with  
regular set up and with  $\frac{1}{2}$ " & .006"  
aluminum disc.

#45 - Tested 3/10/15

- ① Good, form, differentiates well - stands out of row. too thin & sharp.
- ② But little change from above except that it is thinner & more pushed
- ③ Try smaller dome in place of disc.

3/25/15  
#45 - Brass Head - Knife edge design -  $\frac{3}{16}$ " diameter.  
Diaphragm of cast cellulose (some) solution.  
mg.  $\frac{1}{4}$   $\text{CCl}_4$  / pt  $\text{C}_2\text{H}_5\text{Cl}$  "001"

- ① Set up with regular arm & large foot & regular capillary
- ② Set up with  $\frac{1}{2}$ "  $\text{C}_2\text{H}_5\text{Cl}$  aluminum disc - regular arm, foot & capillary.

8/26/15.

Morning - with Diamond  
Diss. Feldman.

Afternoon - Recorded Miss  
Luckie - 2 sump. 5 records.

Worked out recording "Statat  
Water" composed by Romano.  
Recorded "Statat" from  
Diamond. Next balance  
cpt. Used # 11 recorder.

Tested out # 11 against  
# 74 recorder with Miss  
Falls voice. # 11 shows  
up excellently. Sounds  
out better than # 74 - is  
go loud & practically as  
full. Cuts off ring on notes  
a little sooner. Made  
all "Statat" records  
with it. They were good.

2/27/15-

Checked up scenery, set up the  
Lo Bell Telephone Picture.  
Worked on Reader #16 - 3  
diameters.  
Illustrations - 1 to the Lo Bell Telephone  
Picture.



Sept 15.  
Next to break to Harry Deep  
can, take examination for drivers  
license and keep book closed in  
morning.

Instructions. Bureau of Div. persons  
in afternoon.

#45 ① - 2/21/15

Peak - sharp - stands out  
well - makes piano sound  
like a yether.

2/20/15.  
Including Diamond & Des. Johnson  
all morning.

Accumulation after noon.

- #45- Brass heat-kink edge  
pattern,  $\frac{3}{16}$ " diameter.  
Diaphragm of acetyl cellulose  
from solution of pure acetals  
+ 1 part  $\text{C}_2\text{H}_2\text{Cl}_2$ .  
① Aluminum disc  $\frac{1}{2}$ " x .006" waxed  
to center of diaphragm.  
Sap phine regular, .038" x .125"  
Ann regular, waxed to center  
of disc & to edge of diaphragm.

#46 ① 3/30/15.

- ① Piano louder than #44  
Very loud - Reeds well  
but sounds like Zither.
- ② Very loud, but has a  
barrelly or horn tone.
- ③ Becomes very full - Zither like  
tone all gone - but barrelly -  
loudness much diminished -

- 3/30/15
- #46 - Biv. head. Knife Edge  
design -  $\frac{5}{8}$ " diameter.  
Diaphragm of acetyl  
cellulose from pelation  
in spots (C.A.C. 3+1 part -  
Cot. 1, 0.4 - 90% thick
- ① Set up with regular arm,  
fairly large foot - large  
area - wax in center,  
waxed to edge of  
diaphragm.  
Regular .038" x .125" Sapphire.
  - ② Needle cocked more than  
above.
  - ③ Loaded with small piece  
of wax.

8/3/15

Quiet up #47.

Tested out #45-46-47 against Lt.

#45 - Weak - Sharp. Sounds out well.  
Makes piano sound like  
a Zither.

#46 - Loud - Less sharp than 45 -  
Sounds out - Zither sound.

#47 - Not as loud as 46 but  
louder than Lt. Sounds out  
well. Sharper than 46.

Tone somewhat Zither like.  
#44 - Good

Took some of the wax fastening  
end of #45 horn to disphragm  
away to make more free.

Added to #47 disc 45006

Soft aluminum.

Cocked neck of #46 more to  
give sharper cut.

Afternoon - Squatted. New  
arrangement to train in New  
arrangement with horns  
test of these

#44 - Very good

#45 - Weak - sharp. Sharp Zither like

#46 - Very loud - blasty horn sound

CHS

#47 ① 4/1/15 - Louder than #46  
 Standard but not as loud as  
 #46) Stamps out nice.  
 Sharp & thin. Gives somewhat  
 zither like tone & peans.

② Holds well, little wick  
 sharp - thin. Slightly zither  
 like tone. Not loud.

#48 - ① Not feed enough.  
 Not in form. Still thin  
 Not good as #47

#47 - 3/8/15  
 Brass head, knife edge pattern,  
 1" diameter.  
 Diaphragm of acetyl cellulose  
 from solution 3 parts  $\text{C}_2\text{H}_5\text{Cl}$  +  
 1 part  $\text{C}_2\text{H}_5\text{Cl}_2$  - .002".  
 ① Regular arm & sapphire.

② Put disc of aluminum on  
 center  $\phi$  .006".

#48 - Brass head, knife edge design  
 1 1/2" diameter.  
 Diaphragm of acetyl cellulose  
 from solution 1 part  $\text{C}_2\text{H}_5\text{Cl}_2$   
 3 parts  $\text{C}_2\text{H}_5\text{Cl}$  - .002"

① Regular arms & sapphire.  
 Aluminum Disc Center  
 .075" x  $\frac{1}{8}$ ".

4/1/15  
Made up list of pearls to take.

Made up #29 pearls.

Loaded #46 with extra weight of  
lead to make more full.

4/2/15 Tests

#44 - As loud as #74 - Stands out better - does not ring so much that is appears to be damped to a greater extent. Notes was

#48 - Not quite as loud as #74 or #44 - Does not ring as much as #44. Notes better than #44 is a little softer & sweeter.

#49 - Little more sensitive than #44 or #48 so that it has a fringe of blast tone quite small.

THE DIFFERENCE BETWEEN THESE THREE IS VERY SLIGHT.

4/2/15

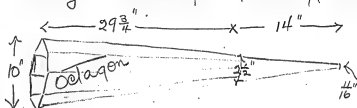
Tested reorders as on other side.

Had made 2 winding horns as follows -

Length  $4\frac{3}{4}"$

Material, sheet zinc .010" thick, lapped & secured joints.

Mouth of mouth 10" of end  $\frac{1}{16}"$  larger end Octagon smaller, round.



Length #2  $43\frac{3}{4}"$   
 Material, sheet pine .010"  
 Diameter: mouth 7", end  $\frac{11}{16}"$   
 Larger portion octagon, smaller, round.



# TEST OF HORNS -

- ① Standard - Clear, clean
- ② Little louder than ① - fuller / inclined to blast at one point
- ③ Little louder than ① - fuller -  
practically as loud as ② but  
no tendency to blast. SEEMS  
THAT WALLS OF HORN MUST  
VIBRATE -

- ① #44 Reorder with #7 horn  
54" from floor - 57" from  
music rack of piano.
- ② #44 Reorder with new #1  
horn, 54" from floor, piano  
not moved so 45" from  
music rack of piano
- ③ #44 Reorder with new #1  
horn, 54" from floor, piano  
moved to 57" from horn.



④ Horn #2 - Guess more distant and sharp effort to voice, and to piano than #1. Differentiates better and does not blast or interfere.

Experimented with #46 recorder on loading. First heavy load, was too full. Gradually decreased load and it became sharper. Tone was not perfect but proved that the dullness is increased by the load & sharpness by the spring.

#35 - Clear, bright, stands out well, trifle sharp & has rather like tone.

#44 - Practically as loud as #35 - fuller definition as good but fullness makes it apparently not stand out as well. Bass notes sound more full and natural. Whole piano reproduction more natural.

#48 - Very like #44. Almost impossible to detect difference.

#47 - Louder & sharper than any of the above. Gives quite a pronounced better like quality.

4/26/5.

Taylor put on.  
Put castings for heads.

Found Reader #35 from Recording Dept by Mr. Walter Miller.

Tested out Readers #35-44-48-47 as per opposite page

Made over #47 with  $\frac{1}{8} \times .006$  aluminum disc on center. Otherwise same as before. Change consisted in increase of size of disc by  $\frac{1}{8}$ ".  
Effect - not so loud - Sharp - not loud enough for commercial work.

Made over #47 with  $\frac{1}{8} \times .006$  aluminum disc on center. Otherwise as before.  
Louder than above & sharper - too sharp for commercial work.

#47-

① - Sharp - brings out treble notes but goes back the bass. Loud - firm - seeds well.

② Less sharp. Fuller.

③ Still more full. Quality fair - bass begins to show out.

④ Still more full, not so loud - back in horn

Mick and Giff's

4/27/15.

#47 - Brass Head - Knife Edge Pattern.  
1" diameter.  
Diaphragm of nitro cellulose

① 1/8" x .006" aluminum disc, regular arm & papphir

② Loaded with small weight

③ Loaded with heavier weight.

④ Loaded with steel heaviest

Mick and Giff's

With Miss Ingrid - tested records #44 against #25.

Hayes, Miss D., Karpin & K separately agreed that #44 gave more natural piano reproduction.

#47- Loud - Stands out fine - Sharp -  
shows hammer stroke of  
piano.

4/28/15

Put new disc, all numbers  $\frac{1}{4}$ " 2.007"  
on #47 recorders & tested each. Result  
opposite.

With horn #7 tested out the  
following recorders.

#35 - (Studio Standard)

#47- Loud - Stands out better - sharper  
shows hammer stroke of the piano.

#44- Loud as #35 - Little fuller - Sounds  
fine - Little more quiet than #35  
Does not show hammer blow  
as much.

#74 - (Merrie Standard) - Loud as #35 -  
Triple fuller - Sounds a little  
better.

Tried same out with long horn #1.  
The effect of this horn as compared  
with #7 is to diminish the percussive  
effect of the piano hammer & smooth  
523

the records cut.

In this test -

#35 - (Studio Standard)

#74 (Remington Standard) - some loudness.  
Little more full. Racois trifle better.

#44 - trifle louder than 35. Slant out  
better - ~~less~~ fuller - 600 notes ahead  
up better.

#47 - Louder. Sharper. Shows Remington  
stroke

---

Flattened needle arm on #48. Makes  
good piano record, better than #35 -  
and probably still better than #44.

Dropped needle on #48 still further

On test against #44 is about  
same in loudness but is a trifle  
sharper & a little more distinct but  
shows Remington shows reverse

Night = Tester #44 recorder  
against #35 for blast and for  
recording at a distance.

#44 blasted more than #35 and  
was not as loud at 6'-12' & 15'.

Compared #47 (1") recorder with these.  
This recorder blasts as loud as  
loud voice close up but is  
noticeably louder at 6'-12' & 15'  
than #35.

Tested #46 recorder (5/8") under  
same conditions. Very sharp and  
unnatural, about as loud as #47  
at 6'-12' & 15'.

Tested #45 recorder (3/4") under  
same conditions. Sharp & unnatural.  
Very slight blast heard & close up.

About as loud as #47 at 6'-12' & 15'.

Tested #43 recorder (3/4") under  
same conditions. Sharp & unnat-  
-ural. Blasts close up. About  
as loud as #47 at 6'-12' & 15'.

Recorders #46-45-43 are louder  
than the larger recorders at  
close range.

4/29/55.

Bueth #48 even with some  $7/8$ " "004"  
aluminum on center. Sharper & clearer  
than before but seems to intensify  
some notes - not as even as  
with disc.

Bueth up #50 new head made  
by Taylor.

Tested out #35-50-44-48  
<sup>(in order)</sup>  
with Miss Ingram playing  
Prologue from Baglacci very  
loud. Used #7 horn - 54" from  
floor - 48" from rest on piano.

- #35 Standard. - blasts slightly rump
- #50 - Blasts fairly - somewhat muffled  
not as clear & distinct as standard
- #44 - Same blasts. Very full, present.
- #48 (as above) Needs much natural  
quality - little muffled.

It is evident that the powder  
must be selected for the horn &  
player. Heretofore when playing <sup>(as)</sup>

myself - (sustained notes - soft touch)  
always picked #41 recorder with  
#7 long horn as best yesterday  
got record of Mr. Edison playing  
(heavy, Staccato, legato, no pedal)  
with same combination. Has not  
got #. With Mrs. Ingers playing  
Pagliacci (very loud & marked), #41  
blatant and did not show up  
much.

In response to note by Mr.  
Edison to make regular record  
with cutter arm at right angles  
to usual, made up regular recorder  
with regular arm and tested out.  
Shows up pretty well. Then took off  
arm & built horizontal arm as  
outlined by Mrs. E.



4/20/15.

Found trouble in MBE's right angled arm recorder of yesterday & changed the arm to remedy.

Made test with this and contrary to expectation it did not chatter but made a very good record.

Mis by further, supporting the arm better.

Made up #2 recorder of same sort. The surface of this is excellent - one of the best I ever heard.

### Night

Made records with recorder #44. Piano played hard - fast. This, played frequently.

Brightened up on diaphragm. This diminished the tendency to chatter and made records quite sharper and better.

Noted that some notes ran

together also. Tried changing horn  
sign # 7 to #4 - small mark  
short horn, Reards were improved.  
Took down pearder #44 & substituted  
for

5/1/15.

Made up another recorder with arm at right angles to regular position.

Tested out this and previous recorder first with right angled arm and then replacing this with the standard arm. In both cases there was a little less surface with the regular arm than with the right angled one.

#50  
Brass head  
5/8" x 1/2"

- ① Blasts noisy, somewhat muffled. Not as clear and distinct as standard.

- #50- Brass head, knife edge pattern, 1 1/4" diameter.  
Graphograph of acetyl cellulose from selected 1 part  $C_2H_4Cl_2$  to parts C & Cl 3, .002"  
Regular sulphur & arm  
① Size 7/8" x .006" in center.

Brass head  
5/8" x 1/2"

#57

① - Even, true nice quality.  
Trifle back in horn. Steel,  
But having raspy places  
on lead chords.

② Not loud as ①. Further  
back in horn. Same pitch  
w/ rasp on low-low chords.

③ Better than ① & ② but steel  
has some bleats - does not  
flex as well as #35. Good  
full tone as loud as #35  
dent does not dent out  
of horn as well.

Made own 57 1/2"

#51 - Brass head - Knife edge  
Pattern - 1 1/2" diameter. (dome)  
Diaphragm of acetyl  
cellulose .002" - from  
solution 1 part Cst. salt  
+ 3 parts Ctl. 3.

① 1/8" x .006" alum.  
dome. Steel arm no foot. Reg.  
sapphire. Arm very flat.

② Same as ① but arm  
raised a trifle.

③ Aluminum arm with regular  
foot - regular sapphire.

Made own 57 1/2"

5/8/15

Made up & tested out #51  
reservoir against #35.

Changed sapphire arm several  
times in attempt to get away from  
a peculiar chipping sound the  
reservoir had. Was unable to remove  
it entirely.

Started building up reservoir  
#51 - did not finish

5/4/15.

Finished up recordings #57 and  
tested out as follows -  
Using horn #67

Piano - ordinary (Northern CB)  
Very full & natural - holds o.k. Little  
back in horn but makes piano  
sound more natural than any  
recorder I ever heard.

Voice AMK speaking. Much more  
natural & fully as loud as #35.

Piano - Could a lot of low chords  
(Turnhauser March). Piano on  
object but very natural quality.

Voice - Flays purring (fratizing at twilight)

Natural - mellow - true. #35  
sounds quite better, is more brilliant  
but not so natural.

Buret #50 over in attempt  
to get #57 quality but one that  
would rock better.

#52

- ① - Very full - natural - mellow.  
In contrast with #35 does  
not stand out (sounds buried)  
Plays on strong low piano  
chords. Is good and loud.

5/4/15  
#52 - Brads head - knife edge  
pattern -  $1\frac{1}{4}$ " diameter.

Diaphragm of cellulose  
acetate .002" from solution  
1 part  $C_2H_5Cl_2$  to 9 parts  $CHCl_3$ .

- ① Same, spun aluminum  
 $15\frac{1}{16}$ "  $\times$  .006" on center. Regular  
drum & sapphire.



#47-

① Tested against #35-  
shows up louder, fuller &  
more natural. Surface good.

② On further test this  
specimen exhibited so badly  
that it had to be torn  
down.

③ Sharper & louder than #35-  
Shows percussive effects  
of piano hammers. Needs  
work.

5/4/15-

#47-

Brass Head, Knife edge Pattern  
1" Diameter.  
Diaphragm of nitrocellulose .005".

① Spun dome about  $7/8 \times .006$ " regular  
arm; sapphire, arm work  
done.

② Arm fastened to diaphragm.

5/11/55

Made tests with Messinger,  
Selection from "Granata".

Horn # 6. - 54" from floor/57"  
from music rack of piano.

# 35 - Standard - Haldoburn. Sharp  
jingles.

# 50 - Fuller than # 35. Fully  
as loud. Brings out the  
bass notes better.

# 51 - More sensitive than 50 -  
Louder. Sharper. Blastier.

# 58 - Very full. Fine quality  
on outside, very natural  
blasts on piano effect.

5/5/15

Built over #51 - same except  
"5/16" x .008" same on center. Still  
very full - back in horn &  
blasted belly on low chords.  
Built over with heavier diaphragm.

0035.

Now holds fine. Fully natural  
but a trifle back in horn &  
not quite as loud as standard.  
Tested out the following other  
members - #50 & 52.

#50 - as compared with #35 -  
not as loud - fuller, does  
not stand out quite as  
well.

#52 - On Voice - finest quality  
of all. On Piano natural but  
inclined to blast on heavy  
chords.

Buck and  
5/7/15  
#5/- As compared with  
#35 this recorder is not  
quite as loud - is fuller and  
more natural. Does not  
stand out as well. The  
cut may be improved a little.

Buck and  
5/7/15  
#5/- Brass Head - Knife edge pattern.  
1/2" diameter - domed top.  
Diaphragm of acetate cellulose  
from solution 1 part  $C_2H_5Cl_2$   
to parts  $CHCl_3$ . 0035".

- ① Aluminum dome  $\frac{1}{16}$ " x .003"  
on center - regulated arm supplies

#53

- ① Lead as 35 - about the same in sharpness. #53 sounds trifle duller & further back in horn.

- ② Trifle more full & stands out better.

5/6/15.  
#53 - Brass Head - knife edge design  
1 1/2" diameter - flat top.

Diaphragm of acetate cellulose  
from solution 1 part C<sub>2</sub>H<sub>2</sub>Cl<sub>2</sub>  
12 parts C<sub>2</sub>H<sub>5</sub>Cl<sub>3</sub> - .0035".

- ① Aluminum dome 1/16" x .006"  
regular arm & sapphire.

- ② Needle dropped a little.

More cum  
5/6/15  
of same stuff

5/6/13

Listened to various Toots out  
last afternoon.

These tests showed up as follows:

- #35 - Standard -
- #47 - Sharper and louder than  
standard. Shows percussive  
effect of piano hammers.  
Holds well.
- #48 - Fuller than #35. Holds few  
notes. Fairly loud.
- #50 - Triple fuller than #35. Not as  
loud. Holds well.
- #51 - Fuller and more natural than  
#35. Back in horn. Rings on  
some notes.
- #52 - Full & loud. Sensitive. Very  
full & natural in tone but  
blasts on some of the lower  
notes.
- #53 - Sharper than 51 or 54. About  
same as 35. About

#47

- ① Sharp. small-pinked medium length neck fine.
- ② Just a trifle louder and fuller than ①.
- ③ Trifle less loud but smooth out all jingles & other inequalities. Very smooth. Surface fine.
- ④ Very loud. Trifle sharp & stringy.
- ⑤ Reduces volume. Still louder than #35. Trifle sharp & stringy.
- ⑥ Louder & fuller than ⑤ on piano. Not so good on voice, sounds like had a cold.

5/6/15

#47 - Brass head. Knife edge pattern 1" diameter.

Disassembly of assembly according to section 1 part 4/4, 4/4 & 4/4 parts 4/4, 4/4

- ① Open aluminum dome 4/4" x .006". Regular arm and capfire.
- ② Used 1/5" x .006" dome same otherwise as above.
- ③ Same as above but with cork cone 9/8" diameter on inside.
- ④ Removed dome from above & mounted arm on small piece of cork.
- ⑤ Put on 3/4" x .006 aluminum dome.
- ⑥ Put 9/8" cork buffer on top.

5/7/15

Built and recorded #57 with cork  
cones on both sides. On test this  
recorder is louder than #35 - tuned  
more natural. Plots on heavy  
chords however. Will hold  
for further tests -

Reacts it also against #57. Is  
louder and does not hold quite  
as well.

Quartette came in afternoon.  
Key baritone doing well. Made  
8 Rigoletto records, 4 of which  
kept. Made 9 "On the Time of  
Rivers" records. These last were  
not so good in balance and  
effect.

Used recorder #35 on one  
of these, ~~not~~ good too sharp  
and did not hold. #74 used.  
Used also 4 way tube & horns



#51-  
 ① - Louder than #35.  
 Miller than #35.  
 Natural quality but  
 blasts a little on heavy  
 low chords.  
 Stands out better than #35

Measure

5/8 1/2

#51-  
 5/7 1/2  
 Brass head, 1 1/2" diameter, knife  
 edge pattern, head domed.  
 Diaphragm of cellulose acetate  
 .002" - from solution 1 part  
 $C_2H_2Cl_4$  + 2 parts  $CHCl_3$ .

① Cork core on inside 9/16" diameter  
 x 1/8" high. Cork core on outside  
 3/4" diameter x 7/8" high. Regular  
 sapphire & arm.

Measure 5/8 1/2

5/8/15

Made record #50 over using cork cones on inside and on outside. Tested out against #74. Held as well. About as loud but sounded more muffled and back in horn.

On loud test - held about as well as #74.

Made over domed head #51 - with  $\frac{7}{8}$ " x  $\frac{1}{8}$ " cork cone inside and  $1\frac{1}{2}$ " x  $\frac{1}{16}$ " cork cone outside with Tarny thin and light.

This record showed up very loud and full on Saturday afternoon and held practically as well as #74. On further test Monday morning was a little more full and did not hold as well, showing that it had stretched somewhat.

#50-

① Compared with #74.

As loud and full as  
#74 - feels as well  
but sounds little muffled  
and back in horn.

#50 - <sup>\$18/15</sup> - Brass Redd. knife edge pattern  
1/4" diameter.

Diaphragm of acetate cellulose  
.002" diameter - from solution  
1 part  $\text{Co}_2\text{H}_2\text{Cl}_2$  + 3 parts  
 $\text{CHCl}_3$ .

Cork cone on inside - 1/4"  
diameter x 1/8" high - cork  
cone on outside 1" diam.  
x 1/16" high. Regulated arm &  
needle.

Made saw 5/8/10-  
#57

① - Louder & Fuller than  
#74 but inclined to  
finge. Has then tightened  
up more & held as well  
as #74. Decided to hold  
over to Monday morning  
and see if it held.  
Apparently louder & fuller  
than #74 holds as well.

Made saw 5/8/10-  
#57-

5/8/10-  
Press head - domed top -  
1 1/4" diameter, knife edge  
pattern.

Diaphragm .002" - acetate  
cellulose from solution  
1 part C<sub>2</sub>H<sub>5</sub>OH

① Cork cores - 5/8" x 1/2" inside  
1" x 1 1/16" outside. Both turned  
thin. Regular sapphire  
and arm.

5/10/15.

Tested out record # 51 against # 74 after leaving it out from Saturday to see if it reached stretch. It was fuller and did not hold as much as on Saturday and must therefore have stretched somewhat.

Made up report.

Made up cork cones for records.

Tested out # 36 as previously made ( $\frac{1}{2}$ ). Triple sharp & rather like in tone.

Replaced aluminum disc with cork cone.

Record becomes fuller, same loudness & quality of standing out well but fails to respond to the notes of higher register.

Recorded # 51 was tried - first as it stood - very sensitive & full. Would not stand loud sounds as well as # 74. Then tightened up. Some of the very full quality was removed and the record was more

Row # 74.

- #74 - Standard.  
 #48 - Fuel - more muffled & rattly than 74 - not quite as loud and does not stand out as well.  
 #44 - Loud as #74 - practically as fuel - holds fire.  
 #51 - Loud as #74 little sharper and does not hold as well. Has fringes.  
 #74 - Standard.  
 #50 - Not quite as loud as 74. Shows hammer blows of piano. Plucky.  
 #54 - Very sharp - loud. Unpleasant.  
 #86 - Loud - little sharp. Holds fire even better than #74.

5/11/15.

Built over #44. Ruined one diaphragm by puncture. A second snapped when tightening up. This gave me cue to heat the head so as to soften the diaphragm material. This gives also much lighter strutting.

#44 held fine but was not loud enough and had a bad rattling quality.

Diaphragm cracked from strain. Built over with cellulose nitrate diaphragm. Tight stretched by heating. Was too sharp & thin.

#54 (new one with high domed head). Built up with ink cones inside and out. Diaphragm tightly stretched. Is too sharp & thin.

Tested out with piano the following reorders with results on opposite page -

#74 - #48 - #44 - #51 - #50 - #54 - #86

#44 -

- ① Needs fine but is not  
loud enough, somewhat  
sharp and rattles on  
piano notes.

#44 - 5/11/15

Brass head  $1\frac{1}{2}$ " diameter, knife  
edge pattern.

Diaphragm of acetate cellulose  
.002" from solution / part  
 $C_2H_2Cl_4$  + 2 parts  $CHCl_3$

①

Aluminum dome spec  $\frac{7}{16} \times .008$ "  
Steel arm without foot, regular  
.038" x .125" sapphire. (Stretches  
tight)

Diaphragm cracked  
through sustain  
Binet gun



#44

- ① First trial with Miss  
Sungard at piano. Thin &  
sharp but heads well. Fairly  
loud.

5/13/15

All tests on this date  
show fine. This record  
will show, however &  
Dante's test.

5/11/15-

#44-

Brass head.  $1/4$ " diameter. Knife  
edge pattern.

Diaphragm of nitrocellulose  
scamphor (Piermans old stock)  
.002". Sketched very tight.

①

Cork cone on outside -  $5/8$ "  
diameter &  $1/8$ " thick. Steel arm.  
Too fast. Regular .038 & .05 caphrine.

#57

① On first trial with  
Moss Ingot was sharp  
& thin - hardly loud & seemed  
to stand out & hold well.

② Compared with #74 & #55.  
Sharper than #74 - about same  
quality as #55. Not quite  
as loud as either. Acety  
better than either.

1-  
micrograph

#54 -

5/11/5.

Brass Head,  $\frac{1}{2}$ " diameter, knife  
edge pattern. Domed Head.

Diaphragm of acetate cellulose  
from solution 1 part C<sub>6</sub>H<sub>6</sub> Cl<sub>2</sub> +  
2 parts CHCl<sub>3</sub> - .002" thick.

① Inside cork cone  $\frac{5}{8}$ " x  $\frac{1}{8}$ ". Outside  
cork cone  $1\frac{1}{2}$ " x  $\frac{1}{8}$ ". Regular arm  
2000 x 1000 papphus.

5/12/5  
② New diaphragm same as above.  
Inside cork cone only  $\frac{3}{4}$ " x  $\frac{1}{16}$ ".  
Regular arm & papphus

1-  
micrograph

#54- Not quite as loud as 74  
or 35. Holds better than  
either. Sharper than 74 -  
about same in quality  
as 35. Excellent holding  
qualities.

Second Trial. Loud as  
#74. Knife sharper & holds  
better.

Made over  
5/15/15

5/12/15.

Made #54 over. Only change was  
use of cork cone  $\frac{3}{4}$ " x  $\frac{1}{16}$ " on inside  
only. Result see opposite.

Made #51 over. Same as before  
but used aluminum cones  
 $\frac{3}{4}$ " x  $\frac{1}{16}$ " inside and out, screwed  
together, no wax being used.



This recorder gave more most  
curious results. ~~The~~  
when first made ~~it~~ was very  
full - ~~the~~ ~~the~~ ~~the~~ but fine  
quality of holding.  
After ~~the~~ ~~the~~ ~~the~~ do not hold so  
well.  
But ~~the~~ ~~the~~ ~~the~~ test had become  
as loud as #74 - held fine, and  
was a trifle sharper.

- 5/12/15-
- ① First trial beans, #51 not nearly as loud as #74 - much fuller - back in horn - more natural. Needs fine Second trial. Did not load so well.

#51 - Brass Head - domed top. knife edge pattern -  $1\frac{1}{2}$ " diameter.

Diaphragm .002" acetate cellulose from solution 1 part  $9\frac{1}{2}\%$   $\text{CH}_2$  + 3 parts  $\text{C}_2\text{H}_5\text{Cl}_3$

Paint Gun 5/12/15-

- ① Aluminum cones  $\frac{1}{4} \times \frac{1}{16}$ " inside and outside, screwed together - no wax used to fasten to diaphragm. Rydell arm secured w/ screw head and  $5/32 \times 1/25$ " sapphire.

5/13/14.

Next over chronograph with  
Taylor & laid out magnets.

Made over #51 - cutting off all  
superfluous metal on screws and  
tightening up diaphragm to the  
limit.

This record is very full, low  
mellow & sweet but bellies on  
low chords. Blast is caused  
by jump-outs.

- 5/13/15-
- ① - Speeds much but sharper than #74. Stands out well and as loud.
  - ② Became much weaker & much more full back in horn.
  - ③ Became little louder & broke less full.
  - ④ Became little louder stands out better & little less full.
  - ⑤ Still louder, stands out better - still a trifle more full than #74.
  - ⑥ Became little more sharp than #74.
  - ⑦ Tests out very good. Trifle louder & fuller than #74. Not quite as loud as #44.

- 5/12/15-
- #55 Brass Head -  $\frac{1}{2}$ " diameter knife edge pattern.
- Diaphragm of cellophane nitrate, .0015" thick  
5/14/15
- ① Cork Cone  $\frac{1}{8}$ "  $\times$   $\frac{1}{8}$ " on inside. Regular arm  $\times$  .025  $\times$  .125" cephire.
  - ② Put under this a brass disc  $\frac{1}{4}$ "  $\times$  .014" to add weight.
  - ③ Reduced above disc to  $\frac{5}{8}$ ".
  - ④ Reduced disc to  $\frac{1}{2}$ ".
  - ⑤ Used  $\frac{1}{2}$ "  $\times$  .012" aluminum disc in place of the brass.
  - ⑥ Used aluminum disc  $\frac{1}{2}$ "  $\times$  .008" & tightened up.
  - ⑦ Back to  $\frac{1}{2}$ "  $\times$  .012" aluminum disc

5/4/15.

Marked on record #55 - finding it to sharp, added weight in shape of disc on the center and thus made it weaker, more full.

Gradually cutting down this weight made it increasingly louder & sharper. Rough never as sharp as #74.

Quartette came. Made 3 call records of Miss Dawson, 3 solo record of Applegate singing "Evening and Morning". Compared Records 74-44-54-55 on this. #54 & 55 were too full & weak, #44 was a trifle fuller than #74 & better.

Made most satisfactory quartette records we have yet made. Balance & time (keeping together) good. Expression showed a marked improvement.

Further tests on #55-LH 74

235.

#55 finally full, loud as 74 & better  
on piano. Not as clean & crisp  
on voice - stands out well.

#44 - louder than 74 or LH - stands  
out better, & fuller than  
74 - excellent on voice  
rears appropriate Miss  
Rosen.

Made up #55 lower.



5/7/15 - ① Good and firm. About  
as loud as #74 - fuller.  
Will try made louder to  
compare with #4088.

Made over  
5/7/15

② On test with player piano  
as loud as #74 with knife sharpen.

③ Fills out slightly.

5/15/15

#54 - Brass Head -  $1\frac{1}{4}$ " diameter.  
Knife edge pattern.

Diaphragm of nitrocellulose  
+ camphor, .002".

① Made over 5/14/15  
Cork disc  $\frac{1}{8}$ " x  $\frac{1}{8}$ " (flat heavy)  
on inside.

② 5/17/15  
New diaphragm .002" same  
material as above, new cork  
disc  $\frac{7}{8}$ " x  $\frac{1}{8}$ " - Regular arm &  
sapphire.

③ Put  $\frac{1}{2}$ " x .008" aluminum disc  
under fast to add slight weight.

Also ~~tested~~ out

#57 - fine - full loud natural

#54 - loud but sharp nice loud.

#53 - just as loud as 57-44

55 - helps well, is a little sharper than 55-57 or 44.

Tightened up #53 - Becomes sharper & develops whistle does not stand out so well as #74.

---

5/7/14.

Saw about getting disc machine for Demonstratory Voice Experiment.

Note Report.

Made over #51 & 54 records. On first test #54 (as made up Sat.) was as full as #74 and held as well and was about as loud. It was not as loud as #55. Still however. Made over to make louder.

Tested

#51 - Stands out fine. Good & loud. Voice natural. Piano much better than #74 - more natural.

#74 Standard sounds sharp in comparison.

#44 - Little more brilliant than 51 & trifle sharper.

#55 - Very big & full - loud - piano good. So full is not quite natural on voice.

- ① Hands out well. Good and  
loud, voice natural. Runs  
more natural than #74.

#51

5/7/15.

Brass Head - domed top -  
knife edge design -  $1/4$ " diameter.

Diaphragm of cellulose nitrate x  
camphor (old stock), .0015".

- ① Cork cone  $7/8$ "  $\times$   $1/8$ " on inside.  
Regular arm with feet & sapphires.

5/18/15.

Rigged up player piano in Hayes room and tried out. Works OK, but does not sound as well as hand playing.

Testing with player piano.

- #74 - Standard
- #44 - Louder than #74 - fuller but rattles
- #54 - About as loud as #74 but sharper.
- #51 - Louder than #74 - Fuller holds well.
- #48 - Not quite as loud as #74 but full & good quality.
- #55 - Whistles so badly it can not be used.

Next send to New York to inspect Kinetophone apparatus for talking pictures for Dr. Bell.

5/19/15

To Kinetoscope Dept. to get reels  
& records in exhibit to Dr. Bell.

These are now kept in the Gas  
House and are in bad shape.

Many of these stored on 3d floor  
of the Studio do not seem  
to be in the gas house. Most  
of the reels & records in gas house  
are in bad shape.

Made several 2 and 4  
minute quartette records. One  
of the 3 minute records good.  
Quartette marked well but no  
better than last week.

Sped out Mrs. Fates on  
Arise from Samson & Dalilah on several  
records with following results:

- #74 - Standard
- #44 - Fuller, louder & more sensitive
- open free
- #54 - Quite fuller than #74, about  
as loud & sensitive.

# 57 - Loud as #74 - Clean - firm.  
Speeds well - about same  
fullness.

Played all the games over for  
Mr. Hayes without letting him know  
which precedes they were. His  
comments as follows

- A - Thin & metallic (74)
- B - Full - stands out of horn  
Solid. Loud (44)
- C - Quality about same as B (57)  
but little weaker
- D - Fuller than A but not as  
good as B & C, back in  
horn (57)

5/20/5.

Tested out recorders & records made yesterday. One of the "Quartette" from Apollo records is good.

Tried experiment of adding short stiff spring and lead weight to one of the regular recorders made up.

Effect was surprising. The spring made the record much louder & fuller.

Tried out same on #51 record, using longer spring of .011" piano wire. Effect same but not so pronounced.

Tried out same on record #51 - first with heavy weight. Apparently weakened record a little. Then used lighter weight. Slightly better results. Then, lighter weight with apparently still better results but record was bleated here.

Starter Education personal  
equation department for business machine.



5/21/15.

Tested out spring and weight  
device on #57 peardew.

This peardew was normally  
good. The spring & weight simply  
made it blast. Had some  
difficulty restoring #57 to  
normal condition.

Tested out this spring and  
weight on peardew #47 (1"  
diaphragm). Made it apparently  
louder & fuller.

Ran "Wartette" from Ryelette  
for Mr. Elson. He said it  
was good in proportion &  
balance but a little weak.

Made #47 peardew over to  
try out spring experiment.  
Tried up with several weights &  
springs. The lighter of these seemed  
to make the peardew a little louder  
and fuller.

Tested also spring fastened to side  
and pressing peardew diaphragm  
toward back. Clean record but  
not remarkable.

5/31/15

- ① Loud-sharp-whistles
- ② Louder-not so sharp-still whistles
- ③ Not as loud as ①. About as sharp as ②
- ④ About as loud and sharp as ①. Whistle has stopped.

5/31/15-

#47

Brass Head-Knife edge pattern  
1" diameter.

Diagram of acetyl cellulose  
0.045 thick from solution 1 part  
C<sub>6</sub>H<sub>5</sub>Al + 2 parts C<sub>6</sub>H<sub>5</sub>Al.

- ① Repaired arm x 0.035-0.05" cap hole.
- ② Right weight & spring added.
- ③ Rejuvenated
- ④ Spring fastened to side of head.

6/22/15.

Mounted #47 regarded up with  
needle supported by wire from  
front in place of rear arm as  
usual for surface test.

Does not exhibit as expected  
and apparently gives a very little  
surface. Will continue this.

~~Reeds~~ cut and rearing, to  
see if warm, damp afternoon  
changed them with following  
results -

#74 - Standard. Seeds & stand out  
well.

#44 - Rounder than #74 - Stand out fine  
& holds - trifle more full.

#57 - Slightly kinder than #74 - stands  
much better

#57 - ~~TIGHTENED~~ - About as loud  
a little kinder than #74. Fuller  
holds.

#55 - About as loud as 74. does not  
stand out as well - Fuller

#57 - Rounder than #55 - Fuller than  
#74 and fuller as loud.

- #74 - Standard.  
 + #51 - Louder than #74. Fuller. Holds  
 about as well.  
 #50 - About as loud as #74. ~~Chorus~~  
 as sharp but has not as good  
 definition.  
 #74 - Standard.  
 #55 - About as loud as #74 -  
 Much fuller. Does not  
 hold as well.  
 + #54 - Not quite as loud as #74 -  
 Fuller. Holds better.  
 #74 - Standard  
 #48 - Loud - Does not hold as well  
 - Fuller than #44 and triller  
 louder.  
 + #44 - As loud as 74 + Fuller &  
 more natural. Holds better  
 than full - good natural

5/24/15

Wrote up report.  
 Made up #54 plander with  
 aluminum disc saw cork cone  
 to get Edison effect.  
 This turned out pretty well.  
 Used light bal. weight and spring.  
 Made it a little louder & fuller.  
 Added heavier weight.  
 Became still more loud & full.  
 Taped out records on opposite  
 page.

- ① About as loud as #74.  
Holds much-voice sounds  
a little sharp & whistly.  
Little more muffled than  
#74 - not as clear & clean
- ② Voice sounds better than  
above. Holds a little more  
clear. The difference  
however is not great,  
a very close match for  
#74 in loudness and  
quality. Stands out as  
much or better than #74  
and holds a little better.
- ③ Becomes noticeably fuller  
and little louder than  
②. Pretty good quality.

5/24/15.

#54 - Brass head - domed out -  
1/4" diameter - knife edge  
design.

Diaphragm of cellulose  
nitrate (old film stock)  
dissolved in 3 parts of  
amyl acetate + 1 part  
acetone.

- ① Cork Cone 1" x 1/8" with  
aluminum disc 1" x .004"  
on inside. Regular arm  
and sapphire
- ② Added light weight spring  
to above.
- ③ Put heavier weight and  
spring in place of above.

- #74 - Standard.  
 #85. ~~My. Recording Dept Standard~~  
 Triple sharper than #74. Stands  
 out triple better - clear - clean -  
 #44 - Much louder & fuller  
 than Standard. Stands out  
 much better. More sensitive  
 & inclined to blast.  
 #51 - Louder & more sensitive  
 than standard - Fuller - Stands  
 out well.  
 #54 - Not as loud as #51 & #44  
 but good - full and natural  
 sounding well. Picked up  
 piano very well.  
 #55 - Good and full - natural  
 slightly sensitive & inclined  
 to flange.

5/25/15  
 Made up recorder #55 as next  
 page.

First trial weak & sharp. Took  
 down and added spring & weight.  
 Makes it a little fuller but still  
 sharp. On examination found that  
 cork would touch on slight motion  
 showing very little play. Made  
 up new diaphragm & cone with  
 thinner cork.

Reard still thin & sharp not  
 loud enough but louder than  
 before. Added spring and weight  
 which makes it fuller but  
 not as loud as #74.

Made further tests of recorders  
 Max Seng's voices as per  
 of note page.

Full supporting needle arm from  
 front with steel wire .011 & linen  
 thread. In both cases reard  
 had great deal of surface  
 was sharp & unpleasant.  
 Added 1/8" o.s.b. aluminum disc to  
 make quiet. Reard still shows  
 surface and is sharp.

5/25/15.

- ① Very low (not loud) sharp
- ② Triple more full.
- ③ Little louder - still sharp
- ④ Little more full - about as full but not as loud as #74.

5/25/15  
#55 - Bidas head - domed top.  
1 1/2" diameter - knife edge pattern.

- ① Diaphragm of nitro cellulose (film stock) - .005" from solution 2 parts amyl acetate, 1 part acetone. Cork cone 1" x 1/2" (fairly heavy) and aluminum disc #1 x .004, flat on inside. Regular arm & sapphire.
- ② Added spring & weight.
- ③ Changed diaphragm & cone & disc - same as above except cone lighter & thinner.
- ④ Added spring and weight.

5/26/15.

Had recording machine cleaned  
and new belt put on.

See agent taking picture in  
Library for Mr. Edison and get  
machine ready for show on  
8th at Studio.

Got 4 heads from Taylor & began  
on #56.

Records of Quartette.

Surprising results. #44 & #51  
records fine on solo and on  
piano records. Went all to pieces  
on Quartette. Showed interference  
on note. #74 record made  
Quartette beautifully.

Took 4 minute recording with  
Werners records #6 & #49. #6  
muffled & not loud enough. #49  
not clean & sensitive.

Made Kinetophone type records  
with #51 Records. These were  
very good and clear.



- ① Piano Test - Note fuller than #74 - About as loud, stands out well.  
Voice Test - Fully as loud as #74 - stands out as well - Rhodes better.

5/27/14.  
 #56 - Brass Head - Knife edge pattern -  $1\frac{1}{2}$ " diameter, domed.

Diaphragm of cellulose acetate from solution  
 2 parts CHCl<sub>3</sub> + 1 part  
 C<sub>2</sub>H<sub>2</sub>Cl<sub>4</sub> - .0025"

- ① Cork cone  $1\frac{1}{8}$ " on inside  
 Regular arm & capphire.

5/27/15.

Got ready for violin deception experiments. Hages got Mr. Johnson from Kellogg's department as violinist.

This test developed that deception was possible - as a number that looked in the box were deceived.

The following improvements were suggested =

- ① That actual plans be used to accompany to divide the attention of the audience and to cover the surface.
- ② Pianist and Violinist be provided with copies of the selection that the fingering as well as the tempo and expression be kept.
- ③ The chances for deception are increased by distance of audience because they can not follow so accurately, can not hear surface, etc. and start to read and

because the sound is more natural  
in loudness because the phonograph  
carries farther, dies at distance.

- (7) Bow should be glycerined  
rather than soaked to secure  
silence on strings.
-

#

# Ranotest

- ① Meakin #44744 #56  
Does not bend out as well -  
- not commercial  
Vasee test  
Rotten surface - Meak - Back  
in horn - N.Y.

Made and  
6/6/5

5/28/15.

- #57- Brass head - domed top -  
knife edge pattern -  $1\frac{1}{4}$ " diam.

Made and  
6/6/5

Diaphragm of cellulose  
acetate from Solution parts  
Catal 3 + 11 part  $C_2H_2Cl_2$   
-.003"

- ① Cork cone on inside  
 $1" \times \frac{1}{8}"$ . Regular arm  
and sapphire.

Sent to Leonard  
5/29/15 as it is  
quality he wants

- ① <sup>same test</sup> almost as hard as #74.  
Ritter sharper, steeper incl.  
<sup>same test</sup>  
Not as hard as #74 - cleaner  
more distinct & less incl  
c's jaw.

Sent to Leonard  
5/29/15 as it is quality  
he wants. ①

- 5/28/15 -  
#58 - Broken head - Domed top.  
knife edge pattern -  $1\frac{1}{2}$ ".

Diaphragm of cellulose  
acetic from solution 3 parts  
C<sub>2</sub>H<sub>2</sub>Cl<sub>2</sub> #1 part C<sub>2</sub>H<sub>2</sub>Cl<sub>4</sub>  
- 003".

Carb Cone on inside  
 $1" \times \frac{1}{8}"$ . Regular arm and  
sapphire.

#44 - Big full, natural-sound  
melody & note just a  
little

#74 - Standard

#57 - Big - fuller than #74 -  
held pretty well.

#54 - Fuller than #74 - about  
as loud - little further  
back in horn.

Cylinder #2

✓ #74 - Standard

✓ #56 - Little fuller than 74 -  
about as loud - Stubs  
out as well.

x #57 - Heavier than 74 or 56  
does not stand out  
as well - Not Commenced

#58 - About as loud as #74  
Little sharper, also  
fine.

5/28/15 -  
Made up records 57 and  
58.

Tested the following records -  
with upright piano -  
2-#7 horns - 32" from piano  
to 6" from floor. which results  
on opposite page.

Voice trials with same on  
with page.

Tried piano recording

A Upright piano - 2 horns 1/2"  
from strings

B Grand Piano - 2 horns about  
36" from center of strings

C Grand Piano - 1 horn same  
as before.

Of these A was loudest - good

B was softest - excellent recording

C was louder than B and  
wavery - not as good.

2 horns seems to improve  
piano recording.

# 74 Standard - Pleats slightly.  
# 57 - not as loud, more  
clear & distinct & holds well,  
ss fair, - not as clean.

# 57 - Rotten Surfaces - Neck  
Back in horn - N.Y.

✓ # 56 - Fully as loud as 74  
stands out as well - holds  
better than # 74 -

# 54 - Not as loud as 74 - holds  
poorly well

# 51 - Louder than any of the  
above - stands out well  
holds about as well as  
74 -

May 24 -

5/29/15.

Arranged to shape cork covers on  
diaphragms more accurately  
and made several of these!

Arranged with Taylor about  
pencil point arrangement on  
the chronograph.

For Leon record # 57 & attempted  
to blow own. Cracked Diaphragm.

Met Mrs. R. Willbourn & Miss  
Milletta Willbourn, # 3607 Chestnut St.  
Philadelphia, Pa. Mrs. W. Contracks  
Mast. Soprano & pianist.  
Mr. E. engaged for experimental  
recording.

5/2/15  
Decoration Day.



#74 - Standard.

#44 - Louder, fuller more natural than #74.

#51 - Louder, fuller more natural than #74 - not quite as good definition as #44.

#54 - Not as loud as #44 or #51. Fuller more natural than #74.

6/1/15.

Worked on cork cones for recorders.  
Worked on recorders #57.

Wrote up report.

Wt Johnson and I with Miss Impud rmouse, tried out violin illusion experiment for Diamond Dece Demonstrating. Seemed to be successful. Wt MRP & Mr. E. to see it.

Fred Mose Impud on imitating voice with cone. Delusion not good. Could easily locate difference between sound of phone & Miss I.

Fred Olson recording with recorders #54, 44, 51, 54, with results opposite.

① Sharpen Hgn #74 - Further  
 back in horn. Cleaner,  
 better definition.

Made over 6/15  
 See Book #2

#57

6/15.

Brass head - domed top -  $1\frac{1}{2}$ " diam.  
 Knife edge pattern.

Diaphragm of acetyl cellulose  
 from solution of 2 parts CH<sub>2</sub>Cl<sub>2</sub>  
 1 part C<sub>2</sub>H<sub>5</sub>Cl - 1003". I dead  
 heated on stretching diaphragm  
 otherwise it breaks.

Made over 6/15  
 See Book #3

①

Cork cone shaped to fit head  
 $1\frac{1}{2} \times \frac{1}{8}$ " on inside. Regular  
 sapphire and arm

Made copy  
6/5/15 See Book 3

- ① Much louder than #74.  
Tuller. More surface. More  
sensitive. - Has flanges
- ② (b) after tightening  
not as loud and unpleasant  
in surface as above. Tuller  
than #74.

6/5/15-

#59

Quick Copy  
6/5/15 See Book 3

- Brass Head - Domed Top -  $1/4$ " diameter  
Knife edge pattern.
- Diaphragm of acetyl cellulose  
from solution of parts  $\text{CHCl}_3$ , 1 part  
 $\text{CaH}_2\text{Cl}_2$  - .0015"
- ① Cork Cone, shaped to fit head  
 $1 \times 1/8$ " on inside. Regular  
sapphire and arm.

#60

6/2/15

Chief Clerk  
6/10/15  
6/10/15

Brass head, domed top -  $\frac{1}{2}$ " diam.  
Knife edge pattern.

Diaphragm of nitro cellulose  
from solution in methyl acetate  
002.

- ① Cellulose, shaped to fit head.  
 $1 \times \frac{1}{8}$ " - etched inside. Regular  
Sapphire and arm.

6/6/5.

Built up pendars 57-59-60.

attended meeting Engineering  
Committee.

Saw to getting Kinty phone  
outfit. Put up in Chase/Play  
for show on the 8<sup>th</sup>.

#61

6/8/15

Brass head - domed top -  $1\frac{1}{2}$ " diam.  
knife edge pattern.

Diaphragm of nitrocellulose  
from polition in amyl acetate  
00175"

- ① Cork cone on inside, shaped  
to fit head. Regular arm  
and sapphire.

- #74 - Standard.  
 #57 - Sharper - further back in horn - cleaner - better definition.  
 #59 <sup>a</sup> Much louder than #74. Fuller - more surface - more sensitive - surface unpleasant has fringes.  
 #74 - Standard.  
 #60 - Louder - fuller - more sensitive - less surface than #74 - pleasant tone.  
 #61 - Loud as #74 - fuller - holds fine - surface good - pleasing tone.  
 #59 <sup>b</sup> Not as loud and unpleasant and has not fringes as <sup>a</sup>. (Triple fuller)

- 6/3/15 -  
 Made up reeders #61.  
 With Taylor testing out chronoscope.  
 With Lawson getting Library made D Kinoscope in shape for Kinetophone show.  
 Preliminary test of new reeders as per opposite page:  
 Difference between <sup>a</sup> & <sup>b</sup> in #59 is that diaphragm was tightened more on <sup>a</sup>.  
 Further Tests on reeders  
 #57 - Sharper & further back in horn than #74 - cleaner, better definition.  
 #59 - Much louder than #74. Fuller - more surface - unpleasant - fringes.  
 #60 - Louder - Fuller - more sensitive & less surface than #74.  
 #61 - Loud as #74 - Fuller - holds fine. Surface as good.

[ITEM(S) FOUND IN BOOK]

ARM  
Ques for MPA  
#1.1402290 - Signal Horn  
S. Seagrass - 5/18/15.



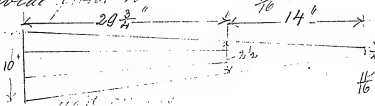
[ITEM(S) FOUND IN BOOK]

Recording Horn # 1.

Length 43  $\frac{3}{4}$ "

Thick .010"

wide front 10" ending  $\frac{11}{16}$ "

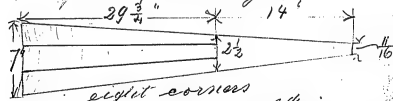


Recording Horn # 2.

Length 43  $\frac{3}{4}$ "

Thick .010"

wide front 7" ending  $\frac{11}{16}$ "



eight corners

Heiler

[ITEM(S) FOUND IN BOOK]

Open.

#1 - Diminishes volume  
Increases fullness

#2 - Diminishes volume } but  
Increases fullness }  
to less extent than #1.

#3 - Diminishes volume } but  
Increases fullness }  
to less extent than #2

#4 - Diminishes Volume } but  
Increases Fullness }  
to less extent than #3 -  
very slightly

**Notebook Series -- Notebooks by Edison and Other Experimenters  
Recorder and Recording Experiments -- A. M. Kennedy Books  
Notebook, N-15-06-04.2**

This notebook is a continuation of N-15-03-17. It was used by Absalom M. Kennedy during June-August 1915 as a daily record of experiments and tests with phonograph recorders. The daily record is continued in N-15-08-02.2. The tests involve various recording machine parts, instruments, and positions of the recording horn. Some entries mention tests of the kinetophone, the "chronograph" and the "kinetophonograph," along with the storage battery search light. Also included are references to Kennedy's collaboration with Newman H. Holland and an experimenter named Taylor (probably Henry A. Taylor) on an Amberola home recording machine and his work for Miller Reese Hutchison on a microphone system. Kennedy's notes also describe other projects such as the preparation of a "talking picture show" for the Commissioners of the Chinese Republic and the training of Diamond Disc demonstrators, and they document Edison's own involvement in the phonograph experiments, including his comments, suggestions, and further instructions. Other individuals involved in the work include F. C. Burt, John P. Constable, Zachariah P. Halpin, Clarence B. Hayes, Archie D. Hoffman, John J. Riley, R. H. Simpson, and George J. Werner. Some of the tests and demonstrations were done on orders from Hutchison. The front cover is labeled "Recording Experiments Book #3. From June 4, 1915. To Aug. 2, 1915. Kennedy." The pages are unnumbered. Approximately 120 pages have been used.

6/4/15.

Finished up and tested out first model of chronograph.

Marks will except the leads. These will have to be of different colors and colored leads will be difficult to obtain. Will try blue points two different shapes to engrave the paper in place of marking points.

The attachment will be redesigned to make better looking and more compact.

Saw to getting Kinetophenograph put in shape. (Sawer was drunken) and synchronized with projection machine. Also projection machine with new take up & synchronizer combined of greater put on.

Saw to getting outfit sent  
to Office Bldg.

Saw Simpson about .008"  
sapphires.

Changed # 59 recorder with  
cork disc on top. Unfortun-  
ately punctured diaphragm  
before test & found on test.

Quartette game. Made  
on 4 good records. #6/  
recorder seems to play out  
better & more natural than  
#7H.

Found that 3 horns record  
better than 2 - being clearer  
and more distinct, especially  
in the baritone and alto.

Found that #5H recorder  
is badly buried - muffled  
and not good.

Found that #51 record had  
stretched 40-50 lbs too  
unsatisfactory. They have to  
watch these records.

Made up record for  
~~test~~ #61 against #74  
announced "Record A" and  
"Record B".

Record A = #74.  
B = #61.

6/5/15.

Saw about getting telephone  
outfit, pygnet horn synchronizing  
outfit etc. & office Bldg.

Saw Mr. [unclear] about repaired  
paper for chronograph records.

Made #59 recorder over &  
tested out. Taylor pronounced  
it very good.

Got 3-.008" sapphires from  
Merner.

afternoon

Changed #60 recorder from  
2 min. to 4 min. & tested.  
Sounds buried, too much  
surface & little rattle.

- ① As loud as #74. Needs  
better. Plans are avail.  
Full natural. Gues  
rather a disc quality.  
Acad. for voice test.
- 

#59. 6/5/5.

Brass/Lead - Domed Top  
1 1/2" diameter.

Diaphragm of cellulose  
nitrate (also film stock)  
from solution in amyl  
acetate.

- ① Cork cone inside 1" x 1/8"  
shaped to fit dome.  
Cork cone outside 1" x 1/8"  
same as above  
Steel arm, no foot.  
To small piece of aluminum  
on top of outside cork  
cone. Regular Sapphire.



6/7/15.

Saw about phonetophone show  
tomorrow. Get records.

Made up 4 min records #57.  
This tested out very good. - well  
round natural, stands out  
well.

Reset record #60 & tested out.  
Much better. Little sharper.  
~~than #57 & does not hold~~  
quite as well but good  
definition.

- ① Very fuel. Holds fine.  
 Riding very good. Voice  
 little muffled.

6/11/15  
 Tested this recorder out with  
 Quartzite. Held but was not  
 clear, clean, distinct. Very  
 fuel & rather loud.

- ① Tested by G. J. Herper  
 Voice test. Little louder  
 than 60 & firmer. Not as  
 clear & clean as should be.

- ① Tested by Miss Ingram  
 singing. Holds well but  
 does not show up clear  
 & distinct.

#57- 6/7/15  
 4 min  
 Brass lead Damed Top  
 1 1/2" diameter, knife edge  
 pattern.

Diaphragm of nitro  
 cellulose. Held film stock  
 from solution in vinyl  
 acetate. .0015"

- ① Cork Cone, shaped to fit  
 head 1"x1/2" on inside  
 .008 sapphire in aluminum  
 Regular arm, large feet.

① Sharper than #57  
More surface. Does  
not stand out as  
well.

② Sharper than #57 but  
not as sharp as ①.  
Stands out better -  
more clear. Does  
not hold as well as  
#57.

6/11/5  
Tested out first with Mr.  
Mayer on separating. Was  
too sensitive. Not clear & distinct.

③ About same as above.

④ Tested by Mr. Mayer, same  
pair. Feel natural tone but  
not clean.

⑤ Tested by Miss Imprud sing  
Not as loud as 57 but little  
clearer. Good.

⑥ Insensitive - not clean - Held more  
but lacks definition & clearness.

6/7/15  
#60 Linlin.  
Brass/Lead, Domed Top.  
1/4" diameter, Knife edge pattern.

Diaphragm of nitrocellulose  
(old film stock) from  
solution in amyl acetate  
.002"

① Cork Cone, shaped to fit  
dome of head, welded  
to inside of diaphragm.  
.008" sapphire, regular  
arm, large foot

② Resit needle flatter.

③ Tightened diaphragm -

6/8/15-

All day getting ready &  
running talking picture  
show for commission of the  
Chinese Republic.

6/4/15.

Saw to fixing sub starter  
and lamp for kinoscope  
installation in Office Bldg.

Tested out the following recorders:  
4 mm recorders

#57 - On voice too full & sensitive  
On piano too sensitive,  
shows interference.

#60 Voice & piano - sharper  
than above though still  
rather full. Better definition  
than #57.

#57 (tightened) Less sensitive  
than before. Little sharper  
than before. Voice & piano  
good.

Neither of these recorders are  
good. Both seem tubby -  
lack definition & clearness. Both  
are full.

Voice Test Miss Ingram  
"Drunk to me Only with these Eyes".

- #57- Too full-barrelly. Lacks definition.  
#60- Not quite as full or as loud as #57 better definition but still not good.

Same Singing Bonny Dundee.

- #60 Lacks Definition - sounds barrelly  
#57- Little louder & little better definition than #60.

Piano with 2 #7 horns.

- #57- Sharp-tin tanny - plunky.  
#60- Not as loud as #57 better quality tho sharp.

Same with long horn #2

- #60 Better. more natural - fuller. better than before  
#57 - louder than 60 - clearer cleaner feel - fair quality

Same. Massed playground  
Priests March very loud. Loud Pedal  
Both Ratten. bad interference.

Same. 47 km. passed &  
further back from Peano.  
Both still interfere. Ratten

Tried again horn, still higher  
and further back.  
Better than before but still  
has interference.

9/9/57

### Minute Records

Piano Test Mrs. Ingram  
Playing: Praelst. March, loud  
but somewhat pedd.

#56 - Notes clear & distinct.  
much better than before.

Same with piano closer

#56 - Holds swell. Stand-out.  
Natural. full

#74 - sharper than #56

Same playing Moszkowski  
Scherzo

#74 - Standard. Clear. sharp

#44 - Fuller. Louder. Stand out  
- Springs a little

#59 - Little more full than before  
but springs a little  
notes. Excellent surface

#61 - Fuller - louder - more  
natural - sweet - Holds  
swell.

#56 - Little sharper than #61



not quite as loud but hoos  
well & natural. Clear, Clean  
distinct.

Same Record Moonlight Sonata  
#7 Horn. Close u.p. focused  
on strings

#61 - Fair record. Natural tone. Rattle  
fuzzy.

Voice Test - 3 minute.  
"When the Corneth" Miss J.

#61 - True, true, natural, loud  
hoos.

#56 not quite as loud as #61. Rattle  
sharpw. Does not stand  
out as well, used or better than  
Standard however.

#44 Sharper than #56. Loud but  
sounds on edge & liable  
to go to pieces.

- #59 - Sharper than preceding.  
Does not hold. Repeats.  
#74 - Standard. Sharper than #61.  
Does not hold as well.
- 

4 minute test

Same Conditions

- #60 - Not as clear & distinct  
as 74-56-61 but better than  
previous 4 minute tests.  
#57 - Slightly louder & fuller than  
#60 but not good as  
2 minute recordings.
-

6/10/15.

Picking & testing Kinetophone  
Subjects in Gas House.  
trying out in office and  
storing in vault.

6/11/15

Tried out telephone subjects  
in Office Building with  
Lewison in morning.

Qualities in Afternoon.

Tried out #5 & 60 new  
4-minute records. These are  
loud enough & hold well but  
lack definition & clearness.

Tried record #61. Heard  
well first two times & began  
to show ripples on third time.  
Afternoon very hot & possibly  
affected playback.

Tried new interpretation, giving  
soprano & baritone more time  
when singing 10th notes.

#51 - Triple sharper than 57 or  
60. Broad and solid. Stands  
out. Clean. Not quite as loud as  
57 & 60.

#57 - Fuller & more barrelly. Does  
not hold as well. Very full  
& organ character sound.  
Little rattling on piano

#60 - Full - barrelly, does not  
hold. Louder than 57. Holds  
piano better than #57.

6/10/15.

Taylor completed model of  
self starter for Kinetophone  
in Office Bldg.

Got 3 more .008" sapphires  
from Nernst.

Miss Ingrid reports that of  
the Victor records, 4 Quartets  
from Pigoletto, that Purple Label

Made up 4 min recorded  
#51 & tested with #57 & 60  
as per opposite page.

- ① Little sharper than  
57 or 60 - not quite as  
loud. Works better & is  
cleaner & firmer.

#51

Clips.

Brass Head, Domed Top.  $1\frac{1}{8}$ "  
diameter. Knife edge pattern

Diaphragm of celluloid (Rae  
film with emulsion removed)  
.0027"

- ① Cork Cone  $1\frac{1}{8}$ " waxed on  
inside of diaphragm. Regular  
sapphire and arm.

- ① Sharp. clear-clean. beads fine. not loud enough.
- ② Not quite so sharp, little louder, beads fine, good for special records by very heavy piano & blasting voice.

6/14/15 - 4 min.  
 #54- Brass lead. Domed Top.  
 1 1/4" diameter. - knife edge pattern.  
 Diaphragm of celluloid  
 (Roll film with emulsion removed) .0028"

- ① Cork Cone 1x18" heavily waxed on inside of diaphragm. Regular Sapphire and arm. .003"
- ② Same but with another cork cone. Stretched very tight with heat.

- ① Quality seems full, good  
natural - seals quite  
hurid and not hard.

#59- 6/14/45: Lamin  
Prase lead. domed top.  
1/4" diameter. Knife Edge  
pattern.

Diaphragm of acetyl  
cellulose from solution  
1 part  $C_2H_5Cl$  + 2 parts  
 $CHCl_3$  - .003"

- ① Cork Cone to fit, waxed on  
inside. Regular arm  
008" aperture



6/14/15

- (59) Neck-Full, natural, some surface. Holds everything.
- (54) - Stands out better - better sharper fine surface. Holds everything.  
Piano.
- (57) - Much louder - full, Pianos fine. Very loud & full.
- (60) - Not quite so loud - full but little fring. Interference with piano.
- (51) - Not as loud as 57 or 60. slight fringe from whistle

Recorder #57 - Shows interference with quater notes particularly piano.

Recorder #57 - sharper but does not show interference not as loud as 57 but clear & distinct.

After listening to piano &  
quartette through recording horn  
there is no wonder that  
records show interference.

6/15/5.

Tested out samples made from records yesterday and find:

- x #59 - Neak, back in horn.
- #54 - Clearer and stands out better
- #57 - Fuller, much louder. Will do perhaps for solo work.
- x #60 - Quality fairly close to #57 but does not hold so well.
- #51 - Not quite as loud as #57 but holds well.
- Give another try out.
- x Buied these over.

Took record of quartette made on #54 record over to Studio to compare with their standard for loudness. It is weak and somewhat sharp. Not good enough in quality.

6/16/15.

Tested out last available reels & records for Kinetophone subjects.

Saw about getting ready for piano record of Mr. Herbert Fryer.

C. F. Holland Esq.  
56 West End Ave  
New York

Schuyler 5337.

Made these records, which turned out good. Learned the following:

- ① He recommends Mason & Hamlen upright piano as being one of the best in America on account of heavy padding of the keys.
- ② For recording, a piano should be played as an organ is, each note held down as long as it should sound and not released.

until the next one is to be struck. The pedal is ~~played~~ <sup>pedaling</sup> up in the air touch should be avoided.

The pedals should be very carefully used - played be held down only during the striking of one chord or harmony and should be released & damped this out when the next one is struck to avoid interference and after ring.

By expression may be given with the finger touch as well as with the whole arm, open damper, metted and such expression is the more intense in its repression.

Tested out Storage, Battery, Search  
Right with Subison at  
night.

6/17/15.

Went with Hayes to Halpin's department to test new type horns on phonographs.

Made piano record of Mr. Hoffman brought over by \_\_\_\_\_

Turned up cork cones for new recorders.

Made up and tested out recorder #58. First test showed back in horn & not entirely clean. Tore down & squeezed wax from between diaphragm & cork cone to brighten up.

Made over  
9/14/15.

- ① First test showed nicked needle.
- ② Preliminary test holds well on piano. Profile sharp.

6/7/15 Lamin

#58

Press Head - Domed Top.  
Knife Edge Pattern -  $1/4$ " diam.

Diaphragm of celluloid (old  
roll film with emulsion removed).  
.003" thick.

① Cork cone  $1 \times 1/8$ " turned to fit  
dome, waxed on inside of  
diaphragm. Regular arm  
.003" capillary.

Made over  
9/14/15

6/18/15  
Made own recorder #60

Geo. Bernard & Burt, hearing trials  
of #74 & 61 recorders said 61  
fuller & more natural.

Found recorder #58 too weak.  
A possible was that the inside  
work cone was too thick and  
was touching the head.

Made preliminary tests on  
4 minute recorders made up  
as follows

- #60 - Fairly full. Speaks well.  
Clean, clear, fairly loud.
- #59 - Not as loud as 60. Speaks  
well. A little sharper &  
cleaner.
- #57 - Very loud and full. Does  
not hold as well as  
others on voice. Good on  
piano.
- #51 - Fairly - too full on voice. Good  
on piano.



- ① Preliminary test with  
piano seems to be good.  
fairly loud and natural.

- 6/18/15. L-min.  
#60 Brass Head. Domed Top.  $1\frac{1}{2}$ "  
diameter - Knife edge pattern.  
Diaphragm of acetyl cellulose  
from solution 2 parts  $\text{C}_2\text{H}_5\text{Cl}$  +  
1 part  $\text{C}_2\text{H}_2\text{Cl}_4$  - .003".  
① Cork Cone, turned to fit dome, used  
on inside,  $1\frac{1}{8}$ ". Regular  
arm. .008" sapphire

6/18/15.

Mrs. & Miss Willbourn came in  
afternoon.

Had to get Mrs. W. down to  
earth to begin work and will  
probably have to continue this  
for several seasons.

With Mrs. W. playing "Annie  
Laurie," made following tests:

- #51 - Harlow. Too full. Barely. Piano  
fine.
- #57 - Sharper. clearer. stands out  
better. Needs better. Piano good.
- #59 - Heavier. Back in horn. Needs -
- #60 - stands out better than #59 - Clean  
full - not as loud as #57.
- Same / closer and louder voice -
- #60 - Needs well. stands out fair
- #59 - Slightly louder - Thinner - Needs  
OK.
- #57 - Very loud & sensitive. Rather  
barely.
- #57 - Very loud. Blasts. Very full.
- #57 - (Shriller) higher - Thinner than  
before but needs better.

6/18/15.  
Duet - Jennata. Mrs & Miss W.

- #57 - Rather loud & dull. Shows slight interferences.
- #60 - Holds better. Triple thinner. Stands out as well.
- #59 - Thinner. Not as loud. Holds.
- #51 - Big, full, louder than alone, holds fine.

Duet under "Old Kentucky Home".

- #51 - Good & loud & true on singing. Sounds hoarsely on speaking.
- #57 - Stands out well. Clearer & thinner than #51.
- #59. Stands out well. Clear, clear, triple thin.
- #60 - Fuller than #59. Stands out well. Holds well.
- #54 - Stands out better than 60 - rattles little on high soprano tones.
- #60 Fuller than 54 but not as loud & does not stand out as well.

6/18/15-

Piano Test

- #60 - Fairly full but does not ring.
- #57 - Fuller than #60. Ring longer.
- #54 - Softer than 57 - Full - slightly plinky.
- #59 - Shows percussion. Plinky.
- #5 - Full, round, loud on piano.  
Rarely on voice.

- ① Preliminary test - sounds  
good. Wheel - stands out -  
Chaw - Reeds.

6/19/15  
#58 - Brass Head - Domed Top. Knife Edge  
Pattern -  $1\frac{1}{4}$ " diameter.

Diaphragm of celluloid (Celluloid  
Film) .003"

Cork Cone  $1\frac{1}{2} \times \frac{1}{8}$ ", waxed on  
inside of diaphragm. (Pointed  
Cone).

- ① Regular arm, .008" sapphire.

6/19/15.

Made sure & tested out garden  
#58.

6/21/15

Note up report.

Raw Lindstone Photo for Owners  
of the Arkansas and Party

With Mrs. Wellbourn.

"Fuller than 60. Stands out a  
little better. Clear. Needs well.

With Mrs. W. again after very full renders.  
"Sharp on speaking voice of piano.  
Singing voice sharper than 57 but  
holds well and stands out."

With Miss W.

"Clear, clear, stands out." "Sharper  
than 51 or 57 but not unpleasant"

With Mrs. Mrs. W.

"Fuller than 60 - More natural -  
Needs well - No interference.

Mrs. W. (6/24/14).

"Sings and does not stand out  
as well as 57."

Mr. Giffert - Baritone

"Not as clear as 57 on voice.  
Tittle fuller. Plans better."

Mrs. W. (8")

"Clear - Clear - Stands out"  
"Sharper than 51 or 57 but not  
unpleasant"

With Mrs. Mrs. W.

"Fuller than 60 - More natural -  
Needs well - No interference."

#59.

6/22/15  
Brass Head - Domed Top.  
Knife Edge Pattern - 1 1/2" diameter.

Diaphragm of Cellulose  
acetate from solution, 2 parts  
CH<sub>2</sub>Cl<sub>2</sub> + 1 part C<sub>2</sub>H<sub>5</sub>OH, 603"

Cork cone made to fit dome  
1" + 1/8", waxed on inside of  
diaphragm. Regular and  
.008 sapphire.



#57

With Mrs. W-

"Very full & loud - barely - oo's.  
Enunciation good. Plans good  
spell.

"Very full & natural on speaking  
piece. Plans very full & natural.  
Singing voice full, natural, natural."

With Miss W.

Very full & natural. Clear. more  
natural than the former recordings."

With Mrs. W.

"Excellent & loudest. Brings out distant  
plans much louder while not  
increasing the voices very much."

Mrs. W. - Alice Samson & Dabbs.

"Full - Shows some interference.  
Little patting."

With Mr. Gelpert

"Very full - Natural. Needs a little  
padding will be good for soft, low  
voices."

6/20/15  
#57 - Brass Head - Domes Top  
Knife Edge Pattern - 1/4" diam.

Diaphragm of cellulose  
acetic (old red film). .003"

Cork cone made to fit dome  
1" x 1/8" waxed on inside of  
diaphragm. Regular arm,  
.008" sapphire.

6/2-2/5-

Daw Riley about instructing new men.

Ran kinstophone show for Ray Daniels pens for M&H.

Made our recorders #5 57-59

Received new 008" sapphires from Simpson.

Mrs. & Miss Wellburn came and made records, using recorders 57-59-58-59-60.

- ① In the course of this recording, noted the following:

With a fairly insensitive recorder, the voice may be used close up. This present then appears to stand out well and even though otherwise sharp, becomes more dull with the close up voice.

- ② In comparing sensitive with insensitive recorders, using voice close up accompanied by piano more distant, the loudness of the distant piano varied a great deal more than the close voice — that is the more sensitive recorder was more

easily detected by the distant  
ears than by the close up  
voice.

③ Sharp recorders seem to bring  
out such overtones as make the  
voice sound an octave higher  
than so really sung. Dull recorders  
seem to bring out overtones which  
make the voice sound low  
in pitch.

④ - note further -  
With Mrs & Miss Millicum, first  
tested proper distance of  
recording them. This seemed  
12" for Mrs & 8" for Miss M.

With Mrs M. at 12" tested following  
#60 - Sharp on speaking voice.  
Trifle thin. Holds well. Does  
not stand out as it should  
#59 - Fuller than #60. Holds out a  
little better. Clean. Holds well.  
#58 Fuller than either of the above.  
Louder. Stands out better.  
#57 - Full as 58 - Stands out but does  
not hold as well. Shows  
barely oos.

#57 - Very full & loud - barely - oo's  
Euphonia long tail. Plans good  
full.

Miss Millburn - Ave Maria  
12.

#57 - Very full natural on speaking voice.  
Plans very full natural

#57 - Singing voice full, round & natural.  
Leader. Stands out better, trills  
sharper. Plans better plunkier.  
Holds well.

#58 - Further back than #57. Trills thin  
weak. Represents heavy notes.

#59 - Sharp on speaking voice & plans  
Singing voice sharper than #57  
but holds well & stands out

#60 - Shows ss. Trills sharp. Clean  
stands out. Holds well.

Miss Millburn.  
Last Rose of Summer at 8".

\*#51 - Full. Loud slight rattles on  
ascending notes. Full natural.  
Subsequently proved voice &  
not recorded caused the rattles.  
CBV



- Duet - "Our Maria" - Mrs & Miss M.
- #60 - Sharp - clean - not very loud -  
no interference.
  - #59 - Fuller than 60 - more natural  
Holds well - no interference.
  - #58 - Full, but back. flight parts.  
Louder than #59.
  - #57 - Fuller than #58 more persuasive  
- more natural & generally better.
  - #51 - fullest & loudest - Brings out  
piano much louder while not  
unwearing voices very much.
-

6/28/57

With Taylor on Chronograph.

Set up new .008" needles in  
aluminum arm.

Had Mr. Gullent to teach  
Diamond Disc Demonstrating  
all afternoon. Made  
records with him with  
records 57-58-59.

- 6/24/14 -

With Hapkin on testing ears for  
5 and 4 minute recording.

With Mr. Gilbert - testing out  
recorders and getting him in trim  
to make records.

It is rather wonderful how a  
voice improves after a few  
phonograph trials. Probably  
for two reasons: because the  
sense of timidity, newness,  
years off and more confidence  
is obtained - because the singer  
sees their <sup>own</sup> defects and is on  
the qui-vive to correct them  
and does.

Gilbert remarked - that he never  
sang with as rich voice before,  
as proof of what the phonograph  
had done for him.

Mrs. Miss Nylhoun came  
after lunch. Tested recorders (m)



with Mrs. N. singing Aria from  
Samson & Dalila.

- #51 - Full - shows some interference  
little pattering.
- #54 - Sharper & thin. Holds well but  
not as loud. Clean.
- #57 - Holds better - trifle sharper than  
51. Stands out. Clean. Clean.
- #58 - Not as loud. Does not stand  
out as well as 57. Good  
surface.
- #59 - Trifle thinner. Does not stand  
out as well as 57.
- #60 - Sharper & thinner. Slight  
patter. Piano thin.

Geo. Warner came over. Changed  
to #4 (small horn). This proved  
very much fuller, curiously and  
makes one stand out while  
diminishing the piano. Mrs.  
N. sang very low & close up.  
Changed to #7 horn. Mrs. N.  
sang louder & further away.  
made better records.

Wah Mr. Gilbert singing, tested  
Naxes for Halpin on home  
recording.

- #51 - Very full. Natural. Holds  
OK. This recorder will be  
good for soft, low voice.
- #57 - Good - natural - true - holds  
well - clean - clear. ~~Pretty~~  
sharper than 51 but still  
soft & mellow.
- #58 - Sharper - stands out well -  
clear - clean.
- #59 - Not as clean as #58 on  
voice - trifle fuller - piano  
better.
- #60 - About as full as #59. Holds  
well. Piano does not show  
out as well. Record does not  
stand out as well as #57.

6/25/15  
Bunt up, recorder #53

This recorder is sharp & thin as compared with #57 and emphasizes what was noted that a dull recorder does not seem particularly louder close up but does bring out more distant sounds louder - while a sharp recorder, while apparently as loud close up, is very much less loud for distant objects.

Mr. Culbert came for more instruction.

Suggest that since the Diamond Disc is put out as a musical instrument and will go before musical people, issued it not be used for the demonstrations also. A full musical - it may be possible to get new hearing the Boston Conservatory, etc. at the same rate as our present demonstrations

Gilbert came over & sang again. #57 recorded which we picked yesterday as best showed up too. Feel with him - gave him tones. Tried out others and decided on #9 as better. They had him sing louder from further distance when #9 became too sharp. #57 again best. Shows that Fullingoy is inversely as distance from the horn.

Quartette came promptly after lunch. Began with arpeggios - soprano - alto - tenor - baritone. Of these the soprano only was good.

Made trials at Quartette from Pizzolotto. Those made were not up to standard - no one seemed in humor for it. Tried this from Faust four times and showed improvement. Reading was apparently weak and did not stand out. Believe this due to their not being close enough to horn as a subsequent heard by Mrs. Rensen stood out well.

This matter of placing before the horn  
is very important - the horn showed  
he at the right right and the  
finger at the distance to get the  
best results. The peard was  
otherwise he blamed incorrectly.  
Peard #57 showed little of  
interference & punctuiveness. Made  
other peards with #57 which showed  
up cleaner & better.

#58-  $6/32/15$  -  $1 \text{ min.}$   
Broadhead - knife edge  
design -  $1\frac{1}{2}$  diameter - flat  
top.

Diaphragm of acetate cellulose  
from solution 1 part  $\text{C}_2\text{H}_5\text{Cl}$   
to parts  $\text{CHCl}_3$  - .0035.

① Aluminum disc  $10/104006$   
Regular arm - .008"  $\pm .075$ "  
Sapphire.

6/28/15

Write up report.

Meeting Phonograph Record  
Committee. Instructed to  
develop Amberola so same  
Recording, getting good recording  
not publish out of it.

6/09/15

Made up 100° sapphires in  
arms.

Worked with Miss Imprunjen  
plans peardng. Found that  
softer, clinging, pressure touch  
gave better peards than  
percussive, touch.

Got best peards with  
following arrangement =

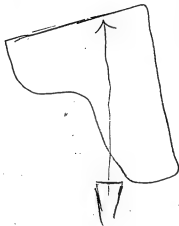
Peard # 57

Ham # 7

50° gem floor

67° gem piece

valve of peard





at night. Ties out pear  
made of Mr. Gilbert.  
Very full & natural. Ring good  
but not loud & does not  
stand out as well as common  
real pearls.

---

6/30/15.  
Records of poor interpretation  
with Hayes.

Not whistled out of recorder  
#57. Tried piano record with  
etc.

Tried out recorder #57 for  
piano record. Both these  
sound good.

Tried out home recording atackm  
ent made up by Holland for  
Ambrosia 30 machine. This cut  
too deep due to too much weight  
on needle. Needle also has  
number of nicks in it.

Found also that recording  
was done with .013" sapphire  
& reproduced by .008" ball.

With Hayes judging machines

7/1/15

Teaching Disc Demonstrators.  
all morning.

Mr. Edison brought in  
correspondence from Philadelphia  
concerning complaints by  
Blake & Burkhardt.

Afternoon had Miss Ryge  
in reading. She has a fresh  
voice but with lot of tremolo  
& no especial quality.

At night went over records  
& correspondence about  
Philadelphia trip.

encs

7/15-

Teaching Desc Demonstrators  
all morning.

Got correspondence of  
people for Philadelphia  
trip.

Quartette came in afternoon.  
Could not at first get any  
records. everything blurred,  
Fred changing some distance  
etc. At last lightened up  
records & made good record  
from recording stand point  
but they did not sing well  
together. Damp afternoon.  
This evidently explains  
diaphragm.

Made record Miss Allie  
Rensen & showed Mr. E.  
He said it was good.

7/2/15.

Morning Teaching Diamond  
Disc Demonstrators

Afternoon - Examination Diamond  
Disc Demonstrators.

7/6/15

Taylor finished up new records  
had with stops to record some  
selling each time.

Get records, reproduce the to  
go to Philadelphia.

Next to Philadelphia.

7/7/15

In Philadelphia.

7/8/15

Wrote up report & correspondence  
about Philadelphia trip.

Worked on home recording.

Mrs. & Miss Millhoun in afternoon.

Quoted following records:

- #54 - ~~Good~~ surface. Full - Smooth.  
Velocity.
- #51 - Little apparent difference -
- #57 not quite as loud as above.
- #58 Louder, fuller & better tone  
surface than #57.
- #59 - not quite as loud as #58  
but clear & distinct.
- #60 - Recd in horn. Not as loud or  
as the others. Clear & distinct.



7/9/15.

Worked with Taylor on home  
recording.

Made up special record #64.  
~~& better out~~

Tested out all records for  
quartette in afternoon.  
Found all records - good. The  
clear dry day stretched the diaphragm.  
Made records with #59 having  
Hayes about 8" Miss Benson about  
15". Miss Fatis about 12" & Applegate  
about 10" from horns. Balance  
same pretty good. Records were  
louder and stood out better -  
clearer than any 4 min records  
previously made.

A peculiar thing about these  
4 min records is there is no  
tendency to bleed in them.

7/10/15.

Sawinger who will come  
Wednesday afternoon.

Saw Curtis about teaching  
supervision

Saw Mr. Maxwell about teaching  
Rayd x Curtis.

Saw Mr. Edison about flabby  
stretched diaphragms.

Worked on Home reading  
with Taylor.

7/12/15-

With Halpin & Hayes, testing  
reproducers.

Set up to run picture for M. H.

Got out Mr. C. G. B. film for  
M. H.

With Taylor and some Benders.

✓ With Curtis (Supervisor) testing  
Berliner & Edison systems of  
recording.

Mrs. & Miss Welbourn came.  
Had Mrs. W. sing as she pleased  
Samson & Dalila. She has  
never done it at all, good  
her way or any other.

Rail Talking Pictures for  
Mr. Durand. Mrs. W. angry  
on return.

7/13/15.

Accumulating information for  
writing directions for adjustment  
of height of reproducer on  
Diamond Disc Machines.

Rich Taylor on ~~former~~ recorder  
for Amherst 30.

Writing report.

Arranging reproducer so that  
arm is parallel with, above &  
below parallel with record in  
reply to Mr. Edison's note.  
Found that some reproducers  
blasted more than others. That  
with the arm down the record  
is more inclined to blast,  
~~is sharper & quicker than~~  
when arm is parallel with  
record.

7/14/15.

With Taylor on Home Recording

Experimented with reproducer arm  
parallel, up and down & reported  
to Mr. Edison.

Made over Records #60 &  
tested out. Thin & weak. This  
recorder was made with  
diaphragm coated with  
casing to preserve from  
moisture make permanent  
for all weather.

Experimented with Rans  
recording with Messingum.  
Experiment on one of Chopin's  
Sonatas proved conclusively  
that the better, clinging stroke  
records much better than the  
quick, forceful stroke. On  
Chopin's Nocturne in E♭ worked  
to improve Miss D's technique  
by evening up loudness of  
left & right hands.

CS:J

- ① Sharp and not loud  
enough. Will lay away  
to clutch.

#60 - 7/14/15.  
- Amminites -  
Brass Head -  $1\frac{1}{4}$ " diameter -  
Domed Top - Knife edge pattern.

Diaphragm of old, real  
film stock celluloid .003"  
Given thin coating of vaseline  
to protect from indistincture.

- ① Cork cone, turned to fit  
dome, waxed on inside  
Regular arm - foot - .008"  
Sapphire.

7/14/15.  
#62- (made 7/9/15) - L min.

Brass head. Knife edge  
pattern. Domed top.  
1 1/8" diameter. Spherical taper  
from ferrule to opening.

Diaphragm of celluloid  
roll film stock - .003".

Cork cone, 1" x 1/8" waxed to  
inside of diaphragm. Regular  
arm of fork .008" sapphire.

7/27/4-

Instructing Riley & King - salesmen  
for new Edison Shop in Syracuse  
on Diamond Disc machine all  
day.



7/16/5.

On Home Recording with Ambrosia  
30 machine

Day damp & rained. Expected  
records would not be good  
~~so~~ got some calcium chloride  
absorption cells & put them  
up in sealed tin can.

Marked on reproducer for  
Hayes. Gave it coat of vaseline  
to protect it against moisture  
or weather.

Sanatella came in afternoon.  
Made several records some  
of them good. One ready to  
mould. Made also records  
of Miss Kansen singing  
Massenet's Elsie. Made  
records of 4 pub. from Tanya.  
Machine went bad on these  
with no capable of being played.  
Made also record of Miss Kansen  
"Are from Samson's Salub." Good.

7/17/15.

Worked on Home recording  
with Ambrosia 30.

Finished up with King & Seelye  
on instruction.

Cylinder reproducers for M.P.H.

Taylor on stringing horns more  
conveniently.

Note up instructions for  
setting height of reproducers  
on Diamond Disc Phonographs.

Wrote up report.

7/19/15.

Made our recorder #57 with  
varielined diaphragm.

Marked with Taylor on some  
recording on Antlerola 30 machine.

Tested out the following recorders  
#60 - Rather, sharp. Reed - feels well.  
plunky for piano.

#57 - fuller & more natural  
#59 - fuller than 60 - little louder &  
more natural.

#62 - fuller & more natural than  
any of the above.

#57 - lead, full, natural, will make  
good piano records.

#57 - not quite as loud as #57 -  
natural & true however - sounds  
like 60.

#57 - sharper than 57 - Reeds well.

Ran Lunitaphone show for Mrs. E.

Tested out voices Mr. Head &  
accompanist.

7/25/15.

Made out #57 recorder.

Discussed Jabbers and Dealers  
convention with Mr. Maxwell and  
Mr. Dretton.

Marked with Taylor on 14ame  
Recording on Amersole CO  
machines.

Miss Imgrey came in afternoon.  
Tested out the following recorders:

#62 - Stands out well - clear -  
natural.

#60 - Fuller - Does not stand out  
quite as well. Pops.

#59 - Good & full. Not quite as  
loud as above.

#58 - Clear. stands out well.

#57 - Sharper - not so good.

#54 - Loud. Stands out

#51 - Finest of all but  
responds to Bb of piano

also tested notes

Miss Ingmund played Tchaikowski's  
Chanson Triste.

① Regular #7 Horn, regular distance.  
Sounded good, clear, clean,  
brilliant.

② Changed to 2 horns #7's.  
More muffled & indistinct, not  
so good - not so clear & brilliant.

③ Long horn #1 close up.  
Little bigger & fuller than small  
horn, but not as clear & clean.

④ Long horn #1 back at regular distance.  
Big - fuller than (1) and cleaner  
than (3).

⑤ Piano 15th away - Long Horn #1.  
Little weaker but fair.

⑥ Piano 15th away - Telephone Horn.  
Piano very good. Clear, round  
clean. Voices, both talking &  
singing very much. Piano very  
natural.

#57-

7/30/15.

~~4 minute~~ Paradise  
Brass Head - Domed Top  
Knife edge pattern -  $1\frac{1}{2}$ " diam.

Diaphragm of celluloid (old roll  
film stock) .003".

Cork Cone  $1\frac{1}{8}$ " moved to inside  
of diaphragm. Regular .003"  
Sapphire and arm.

Diaphragm coated inside and  
out with vasoline to prevent  
weather changes.

7/24/15

With Taylor on Home Recording for  
Ambrosia 30.

Took down #51 Resonance & Pleinets  
with vaselined diaphragm.

Miss Imgrund came in afternoon.  
Tried piano recording experiments.

First with Grand piano - one  
horn. Then up right piano &  
~~two horns~~. Made several trials  
to get distance. Tried  
records 62 & 57. #62 was  
crisper & clearer but #57 was  
fuller & more mellow & round.  
After a number of trials  
obtained good result with #57.  
Then it began to rattle and sound  
never get it right again though  
#62 continues to make good  
records. Then went on music  
room & studied Saxophone from  
Record with Miss J.

C. 151

7/27/15.

Toni Owen records # 51, which  
rattled yesterday and built over.

Deley came in. Spent some  
time getting information of trip of  
his to Asellon Co & Babson Bros.  
giving him information on comparis-  
ons between Victor & Edison records.

About Asellon he states -

- ① That these people take occasion  
to knock Diamond Disc  
principally, stating that  
it is impossible to get  
records, that the diamond is  
simply a talking point that  
the values of the vertical cut  
are more liable to be proved  
out than in the lateral cut.  
Also that they are bringing out  
a new and harder material  
to play 50 times and another  
which will play 500 times.

About Babson Bros, he states  
that a Mr. Reinson (?) showed



him the Diamond Disc and that  
it blasted and he never states that  
almost all of the machines blasted  
and that he corrected it by banding  
the horn guns & limit-pins because  
this was the quickest way.

Mr. Harpman came in afternoon.  
Tried recorder #51 with him. Was  
too full. Tried #62, seemed to  
be good.

Six sang Coat Song from La Boheme  
and Rondo Aria from The Magic Flute.  
Seemed to get good records.  
Sent them back north to  
masters and blue records.

Tried Miss Ingmund on  
Rondo Capriccioso, too #7  
Kerns, A Bright Kerns. Seemed  
fair but found better in last  
one.

7/23/51:

Made and Rebuilt #57 with  
vacuined diaphragm.

Judged horns for Halpin with Hays.

Fixed up returned machines  
for Riley.

Fixed Land Diamond Dice Reproducer  
for Conchable.

Inartette came. Studied Victor and  
own Inartette from Egypt. Made  
3 - not good enough for blue-  
personalities in each. Made  
a Gro's from Aunt. Not good  
Hays went to take funds to see  
new funding funds as used  
Machates as minor.

Fixed Remington Land & Boating  
Diamond Dice Reproducer.

7/24/15.

Experimenting with Constatals  
on loud Diamond Disc Reproducers.

Get Reproducers & Testers out

#23094 - #23063 - #23022

18683 are softer - not as loud -  
fuller & triple more muffled  
not so well as N. (look at  
Hayes Standard).

#9046 & #23081 are triple louder  
than above but quality not  
materially changed.

#23063 made up - Condensate  
(or Bakelite) on cord. One waxed  
to diaphragm.

Marked with Constatals on  
Condensate diaphragms -

19693

7/26/15.

Discussing condensate Desc Diaphragm

Mrs. Smith of Montgomery, Ala came  
for voice trial. Was not in good  
condition for trial. Voice rather  
weak & hoarse.

Made up loud reproducer # 18683.  
Link with phillips matted in. Seems  
best of lot. Took up to Reaso  
to test out. Developed slight rattle.  
Brought back and waxed top of  
link more firmly to cork &  
cone.

✓ Made up # 23094 as above.  
Better sound & clearer than above.

Made up # 23046 as above.  
Better sound than # 23094.

Made up # 23022 with metal  
link. Sounds like # 23046.

6115

7/27/15.

Tests of Good speaking Diamond & Pine.  
Reproducers Shows:

Principle defect is direct:

This may be overcome by

① Seeing that the clamping rings  
are tight.

② That the leaper between link and the  
button ring & diamond lever are  
piled with wax so as to have a  
joint with no loose motion.

That the leanness may be with the  
shells and must be straight.  
This may of course be insured  
by strutting the cord when  
applying the last shell.

A metal link lever as well as the  
shells and cord.

Tests seem to show that this  
reproduction of anything improves  
the quality of voice & some  
voice reproduction - especially the  
voice as it gives it a more  
natural ring.

7/27/15  
Wrote up report.

Made up record #62 with  
Condensate on Japanese paper  
diaphragm. This seems to be  
fine. The recorder has very  
natural quality, no squeaks or  
rattles - is full but not tubby.

Made up record #60 as  
above ~~tested out~~

Began Record #58 as above

7/27/15

Preliminary test = This recorder seems very good. Voice natural, stands out, full, no squeaks or rattles or other noises.

7/27/15  
#62 - 4 minute Recorder.  
Brass & Lead, Dented Top.  
Knife edge pattern,  $1/16$ " diameter.

Diaphragm of Japanese Paper  
dipped in condenserite transfer  
varnish & dried, .0035".  
Cork Cone,  $1 \times 1/8$ "; turned to  
correspond with dome,  
 $1 \times 1/8$ ", wetted with alcohol  
and thus stuck to diaphragm.

Regular .009 sapphire &  
aluminum arm.

#60

7/27/15-

Preliminary test - Little  
more curl than #62 on  
premiums page, very good  
surface, natural, no squeaked  
or nauties or other noises.

#60 -

7/27/15-

L minute, pear drv.  
Brass head, domed top,  
knife edge pattern,  $1\frac{1}{2}$ " diam.

Diaphragm of Japanese  
paper, impregnated with  
condensate transfer varnish,  
& dried .0025". Cork cone,  
 $1\frac{1}{8}$ ", turned to fit dome,  
wetted with alcohol, then  
fastened to diaphragm.

Regular 500° cap-phne with  
regular aluminum arm.



#62 - Syllables better than 60.  
Generally fuller & more  
natural. Pianos good  
of full & round. Does not  
sound as big as #58.

#70 - Syllables pretty good. Not as  
big or loud or full as 58  
or 62. Pianos little weak  
& thin as compared with  
58 or 62.

7/28/15

Finished up recorders #58

Testing out recorders finished up  
as follows

#57 - Very full & sensitive, little  
rattley. Pianos full

#58 - Sharper & stands out better than  
57 but rattles & makes piano  
sound plummy

#54 - Bigger & fuller than 57. Stands  
out better than #57. Pianos  
pretty good.

#57 - Not quite as big & loud as #54  
particularly on voice. Pianos  
pretty good.

#58 - Sounds the best & syllables fine.  
Pianos big full & natural,  
best recorders so far.

#59 - Triple sharps & does not hold  
as well as #58. Pianos not  
so big & full & natural.

#60 - Not quite as big & full &  
round as 58 on voice &  
does not sound syllables  
so well. Good on piano.

#58 - 7/28/15  
Thin pearlescent  
Brass head, domed top,  
knife edge pattern, 1/4" diam.

Diaphragm of Japanese Paper  
impregnated with concrete  
transparent & dried, .003"  
Cork Cone 1 1/8" shaped to  
fit dome, wetted with alcohol  
& hardened. 4-diaphragms.

Regular .008" sapphire with  
regular aluminum arms.

#48 - Good, full & natural though  
not so big as #58.

7/28/15  
#48 - 4 minute powder  
Brass Head - Knife edge  
pattern 1/4" diameter.

Diaphragm of #1207  
condensate varnish on  
japanese paper & air dried,  
0038".

Disc of aluminum  
7/8" x .006" fastened to outside  
of diaphragm by wetting  
with alcohol.

Regular arm with .008"  
sapphire.

#44 - Good & full. Same  
surface, not as good  
as #58.

#44 - 7/28/15 -  
min recorder.  
Brass Head - Knife edge  
pattern - 1 1/4" diameter.

Diaphragm of Japanese  
paper impregnated with  
#1207 condensate varnish.  
.0037" thick.

Aluminum Disc 7/8" .008"  
fastened to outside of  
diaphragm by setting  
with alcohol.

Regular arm with  
508" sapphire.

7/28/15

Had Miss Alice Carey up in afternoon to sing and tested out the following records:

- #59 - Used as standard.
- #44 - Pronunciation - syllables much more distinct. Voice natural & true. Piano good.
- #48 - Voice more natural than #44 - Best of lot in this respect. Piano little loud & inclined to interfere.
- #60 - Makes voice sound trifle juvenile. Piano interference - so sensitive.
- #62 - Fuller. ~~shades better than~~ 60. No interference. Piano natural.
- #58 - Ranks out well. Loud, natural. Piano good - Ranks with #48.

These records, made from Japanese paper, impregnated with condensate varnish which does not get hard

and elastic, give the best  
records I have yet made.  
The voice of piano are more  
natural than with any other  
records yet made.

Believe this to be due to the  
absolutely "dead" or without  
spring nature of the material  
so that it responds readily  
to any sound waves and  
does not add to these any  
vibration of its own.

7/29/15.

Found a bug in #58 recorder  
of yesterday and in attempt to  
correct destroyed diaphragm  
and had to build over.

#60 Recorder of yesterday  
was not good so built over.

Had Mr. Head & Mrs. Minkbe out  
in afternoon. Made tests of  
voice records with new recorders.  
Hans best with #58 & seemed to  
show up nicely. Necessary to  
hold voice back to about 5".  
Shows air. These recorders are  
very much fuller than corresponding  
Hutchins celluloid recorders but  
have very natural tone, very  
little surface and no tendency  
to squeak.

#60 - 7/29/15 -  
4-minute recorder.

Brass head, domed to p.  
knife edge pattern,  $1\frac{1}{2}$ "  
diameter.

Diaphragm of Japanese  
paper, impregnated with  
condensite transfer varnish  
#1207 and dried .003".

Cork cone  $1" \times \frac{1}{8}"$  turned  
to fit dome, inserted with  
alcohol and thus fastened  
to diaphragm.

Regular arm with .008"  
sapphire.



#58- 7/89/15  
+ minute recorder.

Brass shield, domed top,  
knife edge pattern,  $1\frac{1}{4}$ "  
diameter.

Diaphragm of Japanese  
paper impregnated with  
#1207 conductive transfer  
varnish & dried, .0023"

Cork cone,  $1\frac{1}{8}$ " turned to  
flat dome, wetted with  
bleachol and then struck  
to diaphragm.

Regular aluminum arm  
and .008" sapphire.

7/30/15.

In New York experimenting with  
loud speaking reproducer for  
Park Commission.

Determined that our new stiff  
groove reproducer is a little  
than ordinary but not loud  
enough for Park exhibition  
catch notices around.

Had Taylor made up new  
reproducer outlined by M. R. T.  
Reusing top of dome. Solid with  
solder & turned to get uniform  
mica diaphragm.

Night - Experimenting with Automatic  
loud speaking Telephone system. This  
is very loud but requires attention  
and adjustment.

7/31/15.

On orders of Mr. P. experimented further on loud microphone system.

Experimented on Musco Martin Horn with stationary flat top microphone replacement. This is louder and clearer than the regular reproduction.

Mr. Edison turned down the microphone system on account of lack of fullness, or quality.

8/2/15.  
Started Taylor on Chas Edison's  
machine with MusicMaster Horn  
and Mitchisons loud speaking reproducer.

Made up record #53 as per  
next page and tested out:

#53- 8/2/5  
4 minute Mandel  
Brass Head, Knife edge pattern  $1/4''$

Diaphragm of Japanese paper  
impregnated with casein  
#1207 transfer vernish and  
dried. .0025"

Aluminum disc  $7/8 \times .008$  on  
outside

Regular arm  $2 \times .008$  sapphire,

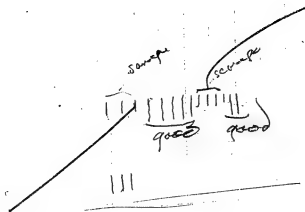
#55- 8/2/15  
1 minute Record.  
Brass Head, domed Top,  
knife edge Pattern,  $1\frac{1}{4}$ "  
diameter.

Diaphragm of Japanese  
Paper impregnated with  
#1207 Condensate Transfer  
Varnish .0032" thick

Cork Cone  $1\frac{1}{2}$ " turned to  
fit dome, milled with ~~6/64~~  
6 thus stuck to diaphragm.

Regular aluminum arm,  
608' Sapphire.

[ITEM(S) FOUND IN BOOK]



**Notebook Series -- Notebooks by Edison and Other Experimenters  
Recorder and Recording Experiments -- A. M. Kennedy Books  
Notebook, N-15-08-02.2**

This notebook is a continuation of N-15-06-04.2. It was used by Absalom M. Kennedy during August-September 1915 as a daily record of experiments and tests with phonograph recorders. The daily record is continued in N-15-09-17. The tests involve various recording machine parts and instruments and variations in the positions of voices, instruments, and recording horns. Kennedy's notes also describe other projects, such as his work for Miller Reese Hutchison on a wireless telephone system and his presentation at a phonograph jobbers convention, and they document Edison's own involvement in the phonograph experiments, including his comments, suggestions, and further instructions. One entry describes Edison's specifications for the "ideal" recorder and includes a drawing by him, which has been taped into the book. Additional comments and instructions by Edison have been taped onto the first page of the book. Other individuals involved in the work include Zachariah P. Halpin, C. D. Ries, and experimenters named Parkhurst and Taylor (probably Henry A. Taylor). Some of the tests and demonstrations were done on orders from Hutchison, Jonas W. Aylsworth, or Charles Edison. The front cover is labeled "Recording Experiment Book #4. From Aug. 2 To Sept. 16." The pages are unnumbered. Approximately 140 pages have been used.



What I am after is to see  
how ~~much~~ far a singer  
can go from the funnel &  
yet give the same volume with  
a small light funnel which  
should not change quality

This should permit ~~us~~ us  
to get loud choros work



I make the flares comparatively  
large to get both sides  
of the waves by return  
reflection



Aug. 2, 1915. contd.

Miss Ingmund came in afternoon.  
Listed out records as follows (Miss  
Soerenga's follow in each case).  
1st Piano - Chanson & nests.

#70 Used as standard (#70 standard)

#44 Fuller. weaker but more natural  
- bell like. [Fuller, more mellow,  
no so brilliant]

#53 Sharper than #44 - little more  
plummy but fuller than 70 [same  
as 44 but not so clear, & a poor]

#55 Tender than 44 or 53 - better &  
clearer & stands out better [tender,  
not so mellow]

#58 Fuller sharper than #55 - Clear-  
stands out well - fine - natural.  
[Not as mellow as 44 - silvery  
more tone especially in lower  
upper hand and thin, more  
mellow than 55]

#60 Little further back than 55 or  
58. Needs more - not as loud -  
[True - a little twang & trilling]

- #67 - Stands out - Needs well.  
perhaps not as loud as 53.  
[not as sweet or even as  
twangy - a little - not as loud  
as 53]
- #57 - Voice sounds nasal in  
comparison. Plans good but  
sharper than above. [Sweet  
not very clear]
- #52 - Voice little more muffled.  
Plans very good. [Sweet].  
mellow. Not much tone - thin  
even]
- #54 - Voice & plans sharper than  
above. Loud. [Not as sweet  
twangy]
- #57 - Not as loud as 54. Little  
softer but shows persuasion.  
[Full - twangy]
- #58 - Clear - not as loud as 54 -  
clear & distinct - little plunk  
[Full - a little back - twangy]

Decided that for plans the  
records were best in order  
named and these were  
again tested:

#52-55-62-58.

#52- Little weak & break in horn.  
Quality plummy.

#62 Voice louder & stands out  
better. Piano quite less full  
ring but clear & distinct.

#58 Voice piano not quite as  
loud as 62. Piano about  
same quality. Clear & clear.

#55 Louder & stands out better than  
62 or 58, not quite as full  
was much ring as 52 but  
clear & distinct.

With two scales - scale 1 &  
soreness on 55 & 62. In  
conclusion.

Voice test.  
Showed 62 & 55 clearer than  
58 & cleaner.

Aug. 3, 1915.

Wrote up report.

Made records & tests of  
Mrs. \_\_\_\_\_ from Kansas.

Ran talking picture for  
Aylesworth.

Finished up phonograph with  
Musica Martin Farm for Chas E.

Began on Record #50 with  
Bald Seater's skin diaphragm. This  
is too weak & flabby. Tore  
down after finishing.

Had Mr. Edison listen at  
Ransford RST - said improvement  
but the persuasive sound was  
pronounced.

Quartette from Regalito. Best balance  
and speaking but poor recording.  
Song from Magnolia Little Harpwood -  
Fine. Piano especially good.

Aug. 4, 1915.

Made up reardur #50 with drum  
head & tested out. Very loud.  
Will need more testing to determine.

Mounted up .008" sapphires in  
arms ready to use.

Mr. Stead and Mrs. Mickle came  
out. Made new piano record  
of Mrs. Mickle. Made record  
also of Stead.

Steads record with reardur  
#58 - Mrs. Mickle with  
#50.

#50 very loud but inclined to  
pitch. Probably because no  
disc or other center drum.  
#51 not so loud & not inclined  
to waver.

1st test.

Seams loud & rather full.  
Rattles a little. need  
further test to determine.

stands out fine.

Aug. L-15  
#50 - 4 minute recorder.  
Brass head. Knife edge  
pattern -  $1/4$ " diameter.

Diaphragm - old drum head  
marked "Porpoise" - .0045"  
thick.

Regular aluminum arm  
and .008" sapphire.

Aug 5, 1915.

Made up Record #41

Took up MPT wireless telephone  
with Mr. Kehr.

Made up record #37.

Mrs. Johannes came for test.  
Had cold. Made trials with  
several records. They were  
not very good.

Miss Alice Carey came for  
trial. She does not record  
well. I do not know why  
as her voice sound clean  
& clear - fresh ordinarily but  
so sharp and not very  
pleasant recorded.

With Mr. Macmullen  
discussion plans for Jobbers  
convention next week.



#41 - Preliminary test - Sharp  
and weak - Too weak for  
use

#41 - <sup>8/15</sup>  
4 minute record.  
Brass head. Knife edge  
pattern -  $1\frac{1}{4}$ " diameter.

Diaphragm old drum head  
marked "Porpoise" - .0047  
to .007" thick. Aluminum  
disc  $\frac{7}{8}$ " x .008" waced on  
outside.

Regular aluminum arm  
and .008" sapphire.

#37- Preliminary test. Sharp  
and very weak N.G.

8/5/15.  
#37- 4 minute recorder  
Brass head - triangular pulsed  
gasket pattern -  $1\frac{1}{8}$ " diameter.

Diaphragm - old drum head -  
marked "Porpoise" - .005-.007"  
aluminum disc waxed on  
outside  $\frac{7}{8}$ " x .008".

Regular aluminum arm with  
.008" sapphire.

8/6/15

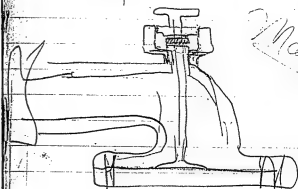
Taylor finished up new recording heads with advance ball arks arranged for DISC as well as cylinder recording.

Made up #66 record from one of these with drum head diaphragm.

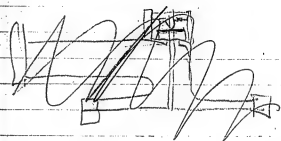
Talk with Mr. Edison on records. He outlined specifications for the ideal record he wanted: - One that will respond readily to soft sounds but will automatically fail to respond proportionally to loud sounds.

Said a substance like flexible stone which would give just so far and then stop would be necessary. That the physical motion of the diaphragm was so slight that mechanical means for amplifying this

57



Make



Reorder  
m.v.



encased probably be a failure.  
Outlined one scheme.



Double diaphragm, strut  
fashion so that the elastic  
limit will hold up further  
motion.

Also sketched, attached  
sheet on opposite page.  
This will have to be resketched  
and made practical.

Quartette came in afternoon.  
Singers in good condition but  
distractions made a rather  
unsatisfactory afternoon's  
work. Mrs. Kurbens work  
especially good. Telephone,  
others in room talking &  
taking plays away make  
such work this unsatisfactory.

Made four quartette records  
and two two. rather very loud

as Miss Rensen was singing  
her best.

Used record #66 as it seemed  
a little clearer & cleaner.

8/7/15

Looked after M. P. & Wireless  
telephone. Designed new coil.  
Bred out coil. Melchior made.

Set up .008" style in arms.

8/9/15-

Made up record # 64.

Got up material for talk at  
Convention.

Made talk & discussion at  
convention.



#64 - 8/9/5  
H minute recorder

Brass head, domed top  
knife edge pattern -  $1/4$ "

Diaphragm of Japanese  
paper impregnated with  
Condensate #1207  
transfer varnish.

Cork cone  $1 \times 1/8$ " turned  
to fit dome having aluminum  
disc  $1 \times .006$ " waxed to it  
and these fastened on inside  
to diaphragm by  
welding with alcohol.

8/10/15

At Convention practically  
all day.

8/11/15

Expected dealer to make  
trial record. Did not come.

Test records of piano  
recording with Miss Ingram:

- #57 - Little louder & sharper than 64
- #64 - Not as loud as #57. Fuller, very  
quiet.
- #66 - Louder than either of above.  
Carries ring of piano longer.

Test again with  
upright piano. This instru-  
-ment is very much out of  
tune.

- #57 - Much more natural than  
upright piano.
- #64 - Softer, not so much ring.  
Hoarseness or deadens down  
ring.
- #57 - Sharper on both voice  
piano.
- #66 - Louder than 57 or 64 &  
carries ring more.

Tried very soft touch on  
peans.

#51 - Very soft. Too low for  
commercial recording.

Brought peans closer to horn -  
within  $1/6\frac{1}{2}$ .

#52 - Better, fuller, sweeter  
than before.

Tried then Tarantella with  
holes 9" & bass 11" from  
horns.

#53 - better than before on  
low high treble notes.

#54 - Voice trial - Miss Ingrid  
singing part of aria from  
Hansel & Gretel

#55 - Natural -

#56 - Very sharper & stands  
out better.

#57 - Natural, but sharper  
than #55

#58 - Louder & little sharper,

#44 - Excellent quality -  
loud & clear -

Miss Ingram then tested  
various methods of  
using voice.

Aderson - went to new  
York to get flexible tubing  
for Mr. S.

8/12/15.

Mr. M.G. Armagost came in morning for voice trial. Sang "Father, Where We Rock". - Has good loud voice, little throaty, but shows lack of practice and forcing.

Finished up record #65 and tested. Showed up too sensitive & loud. Blentyn.

Miss Ingrid came and brought violinist, Mr. Danziger.

Both made trials of records

#58 - Very natural - Good both on violin and piano.

#44 - not as loud as 58. Shows tendency to squeak.

#66 - Quite sharper & clearer than 58 but not so natural.

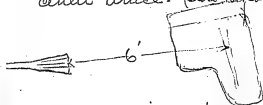
#57 - Sharp - weak - small on violin as compared with

58

Mr. Head and Mrs. Mickle came over in afternoon.

Practised out on piano regarding

- ① Pianos at 6', horn to large center brace. side to horn



- ② Same position but closer  
Horn 4' from brace

- ③ Pianos in line with horn



Results showed ③ much better  
clearer & more distinct than  
① or ②.

Then tried making records with  
upright piano and two horns.  
This showed up better from recording  
stand point than with the grand  
piano but this old upright  
piano is out of tune and rattles  
badly.

Made up master for blue  
record.



8/10/15

- ① Too sensitive and loud for piano. Very loud & tendency to blast on voice.
- ② Very sharp-crank-high pitched. Piano little tin panny.

8/11/15.

#65. 4 minute recorder.

Bases & lead. Domed top.  
Tapered Tube. Knife edge pattern  
 $1\frac{1}{2}$ " diameter.

Diaphragm two thicknesses of Japanese paper coated with shellac, placed together and between two sheets of dry Japanese paper & pressed (only about 30 or 35°) between heater plates.

- ① Regular aluminum arm and 008" sapphire only
- ② Cork cone, turned to fit dome,  $1\frac{1}{8}$ ", unaced to inside of diaphragm, regular aluminum arm and 008" sapphire.

8/23/15.

Changed #65 recorder to 3 as  
per previous page and tested  
out. Did not show up well.

Worked with Taylor on Mr. E's  
stopped w buffin recorder.

Quartette came in afternoon.  
Got down to work quickly &  
made record of Quartette from  
Rigoletto on third trial. Tried  
others without improvement.  
Made trials of Trio from  
Faust.

8/12/10-

Work writing up synopsis of talks  
at convention talks.

8/16/15.

Finished writing synopsis of  
convention talks.

Wrote up report.

Worked with Taylor on Mr. Es  
huff.

First trial of his Taylor had  
public too long. Did not restrain  
enough.

Started Record #65.

8/17/15  
Finished recorder #65 &  
tested. Very loud and stands  
out fine! Full and natural  
tone.

Made up and tested out  
recorder #64. Is thin & sharp  
and not loud enough as  
compared with #58 & #65.

Tested out new recorder #67  
made with buffers. With  
no buffers touching was loud,  
very full with peculiar timbre  
like bango. With bottom buffers  
touching became weaker & sharper  
still with bango timbre. With  
2 buffers, still weaker & sharper  
& with unnatural timbre.

Miss Sangmund came. Tested  
out recorders.

#65 showed up well on piano  
but sensitive & sharpen voice

#64 too weak.

#63 too sharp & brassy.

① 8/7/15 -  
Very loud. Stands out  
fine. Full, natural. Little  
more sensitive than #58.

② With Miss Jungund  
showed up well on piano -  
big, full, loud, natural  
stood out well. On voice  
was not as good as #1 -  
did not pound as natural.

#65 - 8/17/15 -  
4 minute recorder

Brass head - domed top -  
1 1/4" diameter - knife edge pattern

Diaphragm of Japanese paper,  
impregnated with #1207  
condensate transfer varnish,  
.0025" thick.

Cork cone, turned to fit  
dome, 1/8" x 1", fastened to  
inside of diaphragm by  
wetting with alcohol.

Regular aluminum arm  
with .008" sapphire.

- 8/17/15
- ① thin, sharp, break in horn,  
not loud enough.
- ② Thick Moss Imgrund, weak  
thin and sharp on points

8/17/15.

#64 - 1 minute recorder.

Brass Head, Domed Top,  
Knife Edge Pattern, 1/4" diam.

Diaphragm of Japanese  
paper impregnated with  
thin solution of shellac.  
Two thickness of this was  
taken with cork cone turned  
to fit dome between. These  
were heated and thus  
cemented together and to  
the cone, making the  
double thickness diaphragm  
set.

Regular aluminum arm  
with .008" stylus.

⑦

With Miss Ingram on  
piano - loud & ~~staid~~ ~~sub~~  
livel but perhaps more  
stringy than Os.

8/17/15

#63 - 4 minute recorder  
Aluminum head. Domed Top  
Knife edge pattern - 1 1/4" diam.

Diaphragm of Japanese paper  
impregnated with thin solution  
of shellac, two thicknesses  
of which with shellacked  
cork turned & put some were  
heated and thus fastened  
together with the cork  
between, making diaphragm  
about .005".

Regular Aluminum arm  
with .008 sapphire.



8/18/15.

Went over to Kinoscoped Dept to  
look up Kinetophone Film Records.  
Found they had been put in Vault  
#9 and in good shape.

Nick Taylor fixing up outfit in  
Office Bldg.

Made Record # 54-

Miss Ingram came in afternoon.  
Tried lot of piano experiments  
particularly with different horns.  
Found long horn #21 not so  
good as #7. #1 Long Horn  
about as good as #7 on  
piano. Not on voice.

Got improved results with  
Angle horn 22" from head  
of piano, piano cover removed.  
Recording machine raised up  
on box. These recording  
was best we have yet  
obtained with piano.

#54 - Very low sound  
scarcely be heard.

Moderate

8/18/15

#54 - 4 minute recorder.

Brass head - domed top -  
knife edge pattern,  $1\frac{1}{4}$ " diam.

Diaphragm of Japanese paper  
impregnated with thin solution  
of shellac. Two thicknesses of  
this with cork cone  $1\frac{1}{8} \times \frac{1}{8}$ "  
turned to fit dome, which  
is shellacked, between are  
heated and thus fastened together  
making diaphragm about  
.0035" thick.

Regular aluminum arm  
and .002" sapphire.

8/18/15-

Made test with record of Armagost  
the master of which was repro-  
duced once in first half and  
not reproduced in last half &  
per if this made any difference  
as a master.

8/19/15

Teaching Supervisors all day.

8/20/15-  
With Supervisors all morning.

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Quartette came in afternoon.  
Made several trials of Rigoletto  
attempting to improve the  
dramatic work. This was not  
wholly successful.  
Tried Trio from Faust. On  
last trial Miss Rensen failed  
because of snore from humming  
back into the part.

8/23/15..

Wrote report.

Met with Mr. Reaming to see about directions to Dealers & Jobbers regarding horn and reproducer adjustment.

Met with Parkhurst - Reio & Harpin to agree on how this should be done.

Agreed to make up 2 sets of gauges, one plug gauges  $\frac{3}{8}$ " & .955 to be used between reproducers cups and turntable. The other, bent gauge of metal .955 wide. In the first case the gauge will have to be used twice to determine parallelism. In the latter case, parallelism and correct height are determined in one operation.

8/24/15.

Made up records #60.

Miss Ingmund came in afternoon.  
First tried out records, Miss Ingmund singing "Sweet Spirit Hear My Prayer".

#58 - Used as standard.

#65 - Louder, stands out better,  
more sensitive, not quite  
as natural.

#53 - About as loud but not so  
natural as #58.

#50 - Not as loud as #58. Very  
full, soft and natural both  
on voice and on accompanying  
piano but points further back  
in horn.

#60 - Sharper than #50. stands out  
better but good and true. No  
tendency to. bleats

#44 - Like #50 in tone but not  
as loud.

Nest tried angle horn over piano  
at various distances from  
12" to 30". #58 Record seemed  
to give best results. Curiously  
#44 and #50 while not loud enough

8/24/15-  
 #60 - Test with Miss Ingram's  
 voice and piano with angle  
 horn. With voice, trifle  
 thinner than #58 but stands  
 out well and holds well.  
 With piano-angle horn.  
 Holds well, natural. Better  
 than #57 until #57 was  
 tightened.

On quartette does not  
 show up well. Is  
 thinner and sharper than  
 58.

8/24/15-  
 #60 - 4 minute recorder  
 Brass head -  $1\frac{1}{4}$ " diameter,  
 domed top, knife edge pattern.

Diaphragm of Japanese paper  
 impregnated with shellac,  
 two thicknesses with cork cone  
 $1\frac{1}{2} \times \frac{1}{16}$ " between, cemented together  
 by heating. Abent: 005.

Regular aluminum arm,  
 ant. 008" sapphire.



#50 - Miss Imgrud, singing  
"Sweet Spirit Hear My Prayer".

Tone and very natural,  
but not loud enough, and  
back in horn.

Tech piano - ample horn  
abund. Blasty and too full.

8/24/15 -  
#50 - 4 minute recorder.

Draco Head - Trump edge  
pattern - 1 1/2" diameter.

Diaphragm of gold beater's  
skin .001" thick.

Aluminum disc 1 7/8" x .0025"  
waxed to diaphragm and  
which is waxed another  
aluminum disc 1 1/2" x .008".

Regular aluminum arm  
and .008" sapphire.

#44 - Miss Ingrid singing.  
" Sweet Spirit than my Prayer"

Full and natural. not quite  
as loud as #50 - but back  
in horn & dull.

With piano, angle horn...  
above full and beastly.  
Does to pieces on notes  
at all heavy.

With piano, regular position  
dull and natural but not  
loud enough and back  
in horn.

9/3/15 With coat of shellac  
becomes louder,  
clearer & stands out  
more.

8/24/15

#44 - 1 minute recorder.

Brass head - Knife edge  
pattern -  $1\frac{1}{4}$ " diameter.

Diaphragm of gold  
beaters skin, .001". Disc  
of aluminum -  $\frac{1}{16}$ "  $\times$  .0025"  
waxed to diaphragm.  
Another aluminum dome  
 $\frac{3}{4}$ "  $\times$  .006" waxed to this.

Regular aluminum arm  
and .008" sapphire.

9/3/15 - Diaphragm tightened  
& given coat of shellac on  
outside -

on noise were too loud and blasted  
all the pieces on piano made  
this way. He never succeeded  
in getting results to compare  
with those made 8/18/15.

Truck #15 HL 44 50 with piano  
in regular position. Got fair results.

8/25/15.

Took up provisional directions  
for setting reproducers for  
jobbers, dealers and had copies  
made by Mary.

Made up and tested out  
reproducers #'s 54 and 64.

Met with Rice and Skippin on  
Ree Reproducer adjustment.  
Decided not to mention the adjustment  
for tracking in directions. Rice also  
called attention to having left rod  
tight when adjusting and to slipping  
carb board between automobile stop  
tip finger and casting when adjusting  
height of this left rod.

Decided that each should write  
up set of directions and from  
these should be compiled complete  
directions.

#54- Trifle thin and sharp,  
more so on piano than  
on voice.

- With Mrs Ingren - fair  
sharper than #58 & 60s.

With Quantele - too thin  
and sharp.

Made  
over  
9/7/15

8/25/15-

#54- 4 minute recorder.

Brass head, Domed Top,  
knife edge pattern, 1 1/2" diam.

Diaphragm of Japanese paper  
impregnated with shellac.  
two thickness of which are  
heated and thus cemented  
together with cork, 1" x 1/16"  
tapered - between. - .004"

Regular aluminum arm,  
ant. 88° sapphire.

#6H - Little sharp but louder  
slipper than #5H. Held  
for further test.

Further test with Miss  
Sungund - sharp and weak.

8/25/15

#6H - 4 minute recorder.

Brass Head - Domes Top  
Knife Edge Pattern -  $1\frac{1}{4}$ " diameter.

Diaphragm of Japanese Paper,  
impregnated with Shellac.  
Two thickness of which are  
heated and thus cemented together  
with cork cone  $1" \times \frac{1}{16}"$   
between. Diaphragm  
0011"

Regular aluminum arm and  
008" sapphire

8/22/15.

Met with Kappin, Reis and Parkhurst to formulate directions. Called away to wireless telephone for Mrs. Mark and to meeting on cylinder records with T.C.C.

On return got information collected in meeting.

Wrote up provisional directions and had them typewritten.

Miss Darggrund came in afternoon. Teled out following records - singing "Pie as a Bird".

#58 - Standard

✕ #64 - Sharper and not loud enough

✓ #52 - Natural and fuller than 64. Not as loud as 58 and does not stand out as well.

✕ #44 - Too full. Back in horn. Diction not good.

✓ #63 - Good and firm. Stands out. Loud as 58 and clearer.

#65 - Louder than any of the others. Stands out well but sensitive & inclined to bleed.

- #60 - Not as loud as ST but full and natural, little bark in horn.  
Tuffe mushy.
- #50. Full and natural in tone but not clear and clean.

Quartette came in afternoon.  
Mrs. Fatio had a cold. Applegate  
recovering from vaccination.  
~~Three Quartette from Ryoletto~~  
with cow hair serum as  
directed.

These gave very much  
quieter results - I did not  
hear Room Bows before and  
did not know what it was  
until this was brought up.  
Made up a master of this  
also one of L. Bais being by  
Miss Benson.

Had readers 63 & 54  
with Quartette rather  
as good as ST.

Tried #63 and #50 with  
Miss Benson. #63 sharper  
than ST. #50 very full and  
natural but bark in horn and



~~missed. Did not find matter.~~

8/27/15

Met with Parkhurst, Kiepin  
and Reis on Adjustment of  
Disc Reproducer.

Read and Specifications  
by sentences and discussed  
and corrected. Decided to  
rewrite as corrected.

Decided to use large base  
light gauge in place of  
plain 1/8" one.

Smartlett came in afternoon  
Miss Foster had a cold and  
apparently was recovering from  
vaccination as the Smartlett was  
not in condition for hard work.

Fixed up with the new  
hair sensors directed by Mr.  
Edison. These gave very much  
quieter records. I did not  
know what room noise was  
before or never realized the  
standard without it.

Test Records 63 & 64 with  
Smartlett. Neither as good as

58. Made master with 58  
to have blue record made to show  
lack of room noise.

As the quartette could not  
do full work, had Miss Brown  
sing "El Paso" with records  
63, 50, & 58. #63 showed sharper  
than 58, #50 very full and  
natural - so natural that  
all remarked - "does not sound  
like a phonograph but like Miss  
P. singing in another room".  
Is too far back in room and  
apparently muffled however  
to make commercial records.

8/28/15

Note up directions for setting  
reproducers.

Also write up book.  
Looked into clippings by Miss  
D. on voice production, control  
and articulation.

8/20/15

Note up reports.

Made up records #50.

Miss Ingrenud came in afternoon.

Tested out records #'s 58-50-9.

Singing and piano.

#50 (1) - Very full & blubbery. Natural tone to voice but shows interference with piano even when lightly played.

#50 (2) - (Tightened up). Still full & natural. Not so much inclined to blubbery. Back in horn. Muffled. Not loud enough.

#50 (3) - Shellac run around free edge of gold beaters skin. Less inclined to blubbery. Still full & natural but not loud enough & back in horn and muffled.

#58 - Used as standard.

#9 - Sharp-back in horn - not loud as 58. Clear, distinct well defined.

#50 as compared with #58 shows some  
peculiar results.

The waves on #50 under the microscope  
are apparently longer and deeper than  
much 58 yet #58 sounds louder and  
stands out of the horn much better.

- ① Very full and natural. Too sensitive. Blubbers with piano interference even though played very softly. Back in horn. Rather muffled. weak.
- ② As above except less blubbery and sensitive
- ③ As above but still less sensitive and inclined to blubbers.

#50 - 8/30/15 -  
A minute recorder.

Brass Head - Knife-edge Pattern  
1 1/2" diameter.

Diaphragm of Reed-Beaters  
phen. .001". Disc of aluminum  
.017" at center to .001" at edge  
1 1/2" diameter.

Regular aluminum arm  
and .008" sapphire.

- ① as above
- ② diaphragm tightened
- ③ five part of diaphragm  
showing given thin coating  
of phossec.

8/21/15.

Made up records # 69.

P Met with Parkhurst, Rep. Constantine  
and finished directions for setting  
reproducers of Diamond Disc  
phonographs. Had new man test  
this out.

Made up records # 57 -

Tested out records 57-58-69.

57 and 69 are very big as compared  
with 58. 57 is fuller than 69.  
Both are fuller than 58. Both  
are louder & more sensitive  
than 58. Sound fine on  
piano.



#69 - Voice and piano. Very  
loud and big. Quite  
sharper than ST but louder  
bigger & fuller more  
seductive than ST. Good  
on piano.

8/31/5-

#69 - 4 minute record.

Brass head. Domed Top.  
Knife edge pattern -  $1\frac{1}{2}$ " diam.

Diaphragm of Goldbeaters skin  
.001". Given thin coating of  
shellac after being put in  
place. Disc of celluloid  $1\frac{1}{2}$ "  
.007" - pressed to fancy shape.  
Coated with shellac to fasten  
to diaphragm.

Regular aluminum arm  
and .008" sapphire.

#57- Jace and beans.  
Lender, biggest fuller &  
more pengattin than S.  
Rotten on hands due to  
chords. Fuller Hanap.

8/31/15

#57- 4 minute recorder.

Ruass head. Knife edge pattern.  
1 1/4" diameter.

Diaphragm of Japanese  
paper with thin coating  
of shellac after being placed.  
Dise of celluloid 18" x .007"  
slightly domed.  $\frac{.01}{18}$  →

fastened wax in center &  
thickened at edges.

Regular aluminum arm  
and .008" sapphire.

9/1/15-

Made up recorder #68 and  
tests out. Seems to be fine.  
Big - full - looks well.  
Made up #67 recorder. Quality  
similar to #68 - Needle slightly  
nicked so does not give quite  
as good a cut.

Mrs. Ingryd came in the  
afternoon. Tested out recorders.

Singing - as follows:

- #58 - Used as standard.
- #67 - More natural than 58.  
Triple lower, little more  
sensitive.
- #51 - Found. Very natural of  
piano accompaniment.  
Shows interference. Rebuilds  
a little. Too sensitive.
- #61 - Not as loud as 58. Sharper,  
thinner. Piano very thin.  
Back in horn.
- #68 - About same loudness as  
58. Clearer, cleaner and  
more natural. Brings out  
individual characteristics of voice.

#68 - About same loudness as 58, clearer, cleaner and more natural. Brings out individual characteristics of the voice better.

9/10/55 Made quartette record which was better - cleaner & more distinct than #58.

9/11/55.

#68 - 4 minute. Recorder. Brass Head, Knife Edge Pattern  $1\frac{1}{2}$ " diameter.

Diaphragm of Japanese paper, .001" thick, was fixed on inside by shellac, disc of aluminum .003" x 18" and on outside disc of celluloid .007" x 18" pressed in die to fancy pattern. After assembly coat of thin shellac was given the exposed portion of paper.

Regular aluminum arm  $\frac{3}{16}$ " sapphire.

#67- Bigger and more natural  
than 58. Trifle louder.  
Little more sensitive.

9/1/15.

#67- 4 minute Recorder.  
Brass head. Knife Edge Pattern  
1 1/4" diameter.

Diaphragm of Japanese Paper  
dipped in shellac solution  
and dried .003" thick. On  
inside is fastened by heating  
a disc of aluminum .003" x  
1 1/8" and on outside a disc  
of cellulose .007" x 1 1/8" pressed  
to fancy shape in heated dies.

Regular aluminum arm  
with .008" sapphire.

#50. Very full and natural. Does not stand out as the others and not as clean. Fine for piano tone.

#67- Rector. Too loud, Too sensitive. Natural quality.

Further test of #67 and #68 - 68 showed clearer, cleaner and more natural and better diction.

Neither showed good on direct piano recording

Discussed with Miss Ingram theory of equal interval or temperament and natural interval. Also of overtones and harmonics.

9/2/15

Made our record #67 }  
Built up record #69 }  
#64 }

and tested out. All stand out  
of horn well, are full, round,  
loud and natural.

Mrs. Ingmund and Mr.

Deitsinger came in  
afternoon. Tested out the  
following recorders, Mr.  
D. playing violin:

#58 Used as standard.

#68 - Louder. Stands out more.  
"Woody" - fuller sound.

#54 - Violin some what and  
piano very much diminished  
sharper than above. Makes  
violin sound sharp and  
metallic.

#50 - Better. Back in horn.  
Both violin and piano  
natural of full but muffled.

- #54 - Sharp & metallic twang to violin. Buried - not free.
- #57 - Very loud and big. Shows little interference. Sounds too loud or forced.
- #64 - Not as loud as 58 or 51 but true, natural tone. Holds well.
- #67 - Louder than 64 and trifle sharper. Good and natural.
- #69 - Full - big - natural. Not as loud but sweeter than 67 or 68.

Again change to "Allegro Brillant"  
Having more runs and higher notes.

- #69 - Excellent on piano. Low violin notes good. High notes squacky.
- #51 - Louder than 69. Shows interference with piano.
- Voice. Mood singing.
- #69 - Natural, but not as good diction as 58



- 58 - Triple, sharper but a  
little better diction than 69.  
68 - Quite sharper than 67 but  
cleaner. Diction good. Stand  
out well.

It is evident that a good  
full recorder is best for  
piano and for singing.  
For the voice where the  
diction counts - a cleaner  
recorder is desired.

#69 Very good with piano.

Good, full and natural  
with facelin.

Full and natural with  
voice but diction not  
as good as 68 or 58.

An quartette showed up  
very well. On par with  
#58 and 67.

9/2/15  
#69 - 4 minute record.

Brass head, knife edge  
pattern -  $1\frac{1}{2}$ " diameter.

Diaphragm of Japanese  
paper to the thinner side  
of which is shellacked an  
aluminum disc  $1\frac{1}{8} \times .003$ ".  
To the outside is shellacked  
a celluloid dome of  
.007" stock  $1\frac{1}{8} \times \frac{1}{16}$ " round,  
with small stake  $\frac{1}{16}$ " at  
center to diaphragm.  
After setting in place  
diaphragm had thin coat  
of shellac.

Regular aluminum arm  
and .003" sapphire.

#64 - Not as loud as 67 &  
68 but firm. Holds  
well - and natural  
in quality.

On quartette - not as loud  
and clean and clear as 65  
or 67 or 69

9/2/15.

#64 - Minute recorder.

Brass head. Knife edge  
pattern -  $1\frac{1}{4}$ " diameter.

Diaphragm of Japanese paper  
to which inserted hollow  
dome of celluloid, .005" stock  
 $1\frac{1}{8} \times \frac{1}{8}$ " is shellacked to underside.  
Paper then shellacked on  
both sides. Ball of cotton  
wax to fasten center of  
dome to diaphragm.  
Dome of clear celluloid .007"  
stock  $1\frac{1}{8} \times 1\frac{1}{16}$ " fastened to  
outside of diaphragm and  
the diaphragm again  
shellacked.

Requires arm and .008"  
sapphire.

9/3/5.

Experiments with recorders #44

- 1st with loose gold-beaters skin  
diaphragm. - Very full, sounds  
forced. Back in horn.  
2nd. Diaphragm tightened. Stands  
out little better & is clearer.  
3rd. Phellacked diaphragm. Becomes  
clearer, stands out more and  
is louder.

Quiet up recorder #55 but did  
not test out.

Put scales on horns to  
get fixed distances for fingers.  
Quartette came in afternoon.  
First tested out recorders. Appreciate  
singing.

- #58 used as standard.  
#68 Louder and bigger than 58  
trifle sharper.  
#67 Natural quality. Not as loud  
or sharp as 68.  
#69 Not as loud or sharp as 68.  
Natural quality.  
#64 - Not as loud as above. Needs  
much. even.

#9- Back in horn. Sharp.

With Miss Rensen singing:

#9- Sharp. Back in horn.

#58- Louder and more natural than #9.

#69- Not quite as loud as #58. Natural.

#67- Natural. Louder than #69.

#68- Sharper and stands out but  
uncharacteristic.

#64- Natural, Surface shows

#44- Tone good. Distortion notes  
clear as 67-68-69 and not  
as loud.

Set up for quartette. Miss  
Rensen had cold and not in  
full voice.

Hayes covered note mark.

|           |   |             |     |   |          |           |
|-----------|---|-------------|-----|---|----------|-----------|
| Distances | { | Applegate   | 10" | { | Baritone | Right     |
|           |   | Moorhead    | 9"  |   | alto     | R. Center |
|           |   | Miss Rensen | 14" |   | Sop.     | L.        |
|           |   | Hayes       | 4"  |   | Bass     | Left.     |

Made trials with recorders  
#1's 67, 69 & 58. These three  
very nearly the same. Hayes  
left bad. Did not make  
recording through. Made trials  
at Solos and Duets.

9/7/15-

- # 55 - Better than 60 & 64  
more natural but not  
as good as 58-68 or 69.  
Trifle plumpy - does not  
ridg with plans.

9/8/15-

- # 55 - 4 minute recorder.  
Diaphragm of Japanese  
paper .001" first given thin  
coat of shellac. Soft  
aluminum dome .008" x  $1\frac{1}{8}$ " x  $\frac{1}{8}$ "  
shellacked on inner side.  
Coating of shellac then  
given outside of diaphragm  
and euloid cone .007"  
x  $1\frac{1}{8}$ " x  $\frac{1}{8}$ " shellacked on outside.  
Another coating of  
shellac put on outside.  
Regular aluminum  
arm and .008" cap phire.

9/4/15.

Built up record #60 and tested out. Too weak. Back in horn. Trill - natural - thin.

Built up #55 Record but broke diaphragm soon as finished

Miss Ingmund came in afternoon  
~~feeling~~ <sup>feeling</sup> following records.

With Piano.

#58 - Used as Standard.

#60 - About as loud. Natural. Trill sharper, not quite as mellow and round.

Ring test, striking middle C#

#58 - 15 seconds } Hand percussive

#60 - 12 } stroke.

#58 - ring just as long with firm softer stroke.

#58 Used as Standard.

#60 Not as loud as 58 but trill more natural. Note on letter.

9/4/15 - Preliminary test.

Weak, fairly natural  
on voice, then on piano.  
back in horn.

Not as loud as SS does  
not purg. as much. Sounds  
"Woody" or little more  
plunky. Muffled on voice.  
Further back in horn.

Sounds like Xylophone.

Piano "About as loud as SS. Natural.  
Trifle sharper. Not quite as  
mellow and round".

Voice "Not as loud as SS, but  
little more natural.  
Diction better".

9/4/15

#60 - 4 minute recorder.

Brass Head, Damped Top.  
Knife edge pattern - 1/4" diam.

Diaphragm of Japanese paper.  
First given coat of Shellac.

Aluminum dome (tempered soft)  
of 010" material, shellacked to  
inside. Similar dome shellacked  
outside. Exposed diaphragm  
both inside and out given  
coat of shellac.

Regular aluminum arm  
and .008" sapphire -



9/6/15 - Holway - Saturday.

9/7/15 -

Note up report.

Runs up record #54.  
Went over to look at new studio.  
Went over to see Farnel about Bell  
Telephone Kinetophone Show.  
Got Dawson from Mr. Edison.  
at Hayes suggestion set him  
to straightening up music.  
Got Leroy Book and started  
Miss Ingham on getting musical  
data clippings.

Miss Ingham came in  
afternoon. Told out the  
following records:

- #58 - Used as D<sup>+</sup> standard
- #68 - Bigger fuller - louder -  
stands out better - has  
not the fringe that 58  
has - cleaner clearer.
- #69 - Not as clean and clear  
as 68 on voice. Piano  
good and full and natural  
but does not show the

#54 - Preliminary test. Little  
spark, sharp back in  
corn.

not as loud as 58 but  
louder than 60. Quality  
rather like 60 in being  
clinky. Does not stand  
out.

9/7/10

#54 - 4 minute record.

Brass Head, Domed Top  
Knife Edge Pattern, 1 1/2" diam.

Diaphragm of Japanese  
paper - .001" thick, given very  
thin coat of Shellac.

Aluminum disc 1 1/2" x .003"  
(Spring stock) coated with  
shellac & fastened to inside  
by heating. Similar disc  
fastened to outside.

Regular aluminum arm  
and .003" sapphire.

differentiation 68 does. not  
quite as loud as 68 and does  
not stand out as well but  
trifle more natural.

#60 Not as loud as 58. Does not  
ring as much. Sounds 'woody'  
or ~~little~~ more plunky.  
Muffled on voice. Farther  
back in horn. Sounds like  
xylophone.

#54, Not as loud as 58 but  
louder than 60. Quality  
rather like 60 in being  
plunky. Does not stand  
out.

#55 - Better than 60 or 68  
more natural but not  
as much as 68-69 or 58.  
Trifle plunky.

#65 - Loud on voice. Piano shows  
interference on heavy  
chords.

#64 - Goes and firm but does  
not ring or show the  
full natural tone of 58 or  
69 or 68.

#50 Voice very full and deep in  
horn. Goes to pieces on heavy  
notes. Deeply, soft, muffled  
tone.

Voice - Mr. Dawson.

#58 - Standard.

#68 - Stand out. Clean. Clear.  
Natural.

#69 - Not quite as loud or stands  
out as well as 68 but  
natural quality.

#54 - Piano sharp. Voice natur-  
al. Diction not as good  
as 68.

#55 - Not as loud. Diction not  
as good. Muffled. Does  
not stand out.

#60 - Muffled and deep in horn.

#65 - Big sound - stands out on  
voice but piano shows  
interference.

#64 - Natural voice. Piano pretty  
good.

#50 - Full and natural on  
voice but not loud  
enough. Goes to pieces.

on low notes and shows  
interference.

#63- ~~Shrill~~ on, piano, stands  
out well. Give sounds  
natural. Try further.

9/8/15.

Made up recorder #60 and  
tested out.

Made up recorder #55 but broke  
diaphragm on finishing.

Mrs. Imgrund came in afternoon.

Tested the following recorders:

- Milano -

#58 - Used as Standard.

#68 - About as loud, natural,  
trifle sharper, not quite as  
mellow and round.

Ring test striking middle C =

#58 - 15 seconds } loud, persuasive  
#60 - 12 " } strike.

#58 rang as long on softer, firmer  
strike.

Voices

#58 - Used as standard

#60 - Not as loud as 58 but  
little more natural. Action  
better.

#63 - Firmer than 60 but not  
quite so natural. Also better.

9/8/15 #60 Preliminary test

Sounds little sharp and  
not as natural as ST.

9/9/15 Piano - Natural - not as  
loud as 69 but full &  
natural, distinct & clear.

Voice - Voice natural  
full.

9/8/15.

#60 - 4 minute recorder.

Brass Head - Domed Top.  
Knife Edge Pattern -  $\frac{1}{2}$ " diam.

Diaphragm of Japanese  
paper, coated with shellac.  
Aluminum discs, .003"  $\times$  18"  
Tempered - pressed radial  
ridges, fastened inside  
and out.

Regular aluminum  
arm and .003" sapphire

- #58 - Natural. Hoeds, True.  
 #69 - Not quite as loud as 58.  
 Natural. Full. Has a slight  
 metallic accompanying  
 sound.  
 #68 - Good diction. Natural.  
 Shows up well.

Big - Heavy Piano work.

- #68 - Big - clear - full - natural.  
 #69 - Not as clean, full or  
 natural as 68.
-



9/9/15.

Made up recorder #51.

Saw about making Taylor attachment for Amelrode machines.

Mr. E criticized screens as not thick enough. Saw Lusk who says they are regular stuff. Got piece of saw hair. This is  $\frac{3}{4}$ " to 1" broken fluffed out from bending but may be compressed to  $\frac{1}{2}$ ". As the screens were not bent much, is probably full thickness.

Made up recorder #65<sup>1</sup>/<sub>2</sub> testis. This seems - very full.

Miss Ingrend came in afternoon. Made following tests:

- Piano - regular set up -
- #58 - Used as Standard.
- #65 - Fuller but more muffled on voice than 58. Piano

9/9/15  
#51- Preliminary test shows  
sharp, weak, back in horn  
but rods curl.

9/9/15- Piano Very weak and back  
in horn. Not Commercial  
Sharp - Metallic - Tummy. 71.5.

9/9/15  
#51- 4-minute recorder.

Brass Head, Domed Top.  
Knife Edge Pattern.  $1\frac{1}{4}$  diameter.

Diaphragm of Japanese  
paper, given thin coats  
of Shellac. Two discs of  
aluminum, .003" x 18", pressed  
in dies giving radial grooves,  
are fastened on each side of  
this by Shellac.

Regular aluminum arm and  
.008" sapphire.

9/9/15-  
#65- Preliminary Test.  
Very big and full and  
natural both on voice  
and on piano.

9/9/15- Fuller but more muffled  
on voice than 58. Piano  
not as clean as 58 &  
little further back in horn  
but natural tone.

9/9/15  
#65- 4 minute recorder.  
Brass Head, domed Top.  
Knife Edge Pattern - 1/16" diam.  
Diaphragm of Japanese  
paper, 2 thin coats of  
shellac. Disc of aluminum  
1.003" x 1/8" shellacked to  
underside to which is  
shellacked cone of cork  
1" x 1/8" turned to fit dome.  
Regular aluminum arm  
and 808" sapphire.

not as clear as 58 and  
note further back in horn but  
natural tone. Note more  
muffled.

#51 - Very weak and back in horn.  
Not Commercial. Sharp. Metallic  
gummy.

#67 - Good ring. Stands out - big-  
loud - full - natural.

#68 - Note sharper than #67. Not  
quite as loud. Shows out  
individual notes better. Natural,

full.  
#69 - Big - full - natural - about  
like 68. Clearer and louder  
than 67.

#60 - Natural. Not as loud as 69  
but full, natural, distinct  
and clear.

Voice  
#60 - Voice full & natural. Piano  
soft.

#69 - Little sharper than 60. Distinct  
pretty good but tone not  
as natural as 60. Thinner.

- #68 - Fuller and more natural than 69. Dialon good. Not quite as full as 60.  
 #58 - Natural. Not as even as 67 or 68 or 69 or 60 but stands out better.  
 #67 - Not as loud as 58. Natural. Stands out well. Piano does not show as much tendency to interfere as with 58.  
 #65 - Natural - full - holds well even.

Piano with Angle Horn

- Norm 18" from piano.  
 #65 - Too percussive. Jumps out.  
 #67 - Better - holds better better than 65 but still shows percussive effect.  
 Norm 22" from piano  
 #67 - Trade.  
 Norm over front of sounding board  
 #67 - Little better. Not good.

9/10/15.

Made reproductions with blotting paper gaskets. Most of these obtained slight rattle on reproduction. Got one set very clean & clamped tight. This did not show the rattle but reproduced fairly well.

Dupirelli came in afternoon.  
All feeling well.  
Made trials of following records:

- #58 - Standard
- #60 - Hoops well. Full.  
Natural slightly muffled
- #65 - Quite more natural
- #67 - More muffled. Does  
not differentiate.
- #68 - Cleanest and best  
direction of the lot
- #69. Does not stand out  
as well as #68. With  
more muffled.

Made records with #68  
and contrasted this with

#54 and with precious  
recalls. It seems better - clearer -  
cleaner - more distinct and  
more natural.

In three used plays 3"  
Muriel 12"  
Muriel 8"  
Applegate 9".

Noted that good interpretation  
depended a great deal on  
the leader and that on the  
best results he should just  
follow the singer who is  
heavily taking the leading  
part and lead all the others  
by his rather than directing  
the time by his mechanical  
idea of it. In this way  
greater freedom and of seeing  
is obtained while in the  
other the time sounds, as it  
is - forced.

9/11/15

Made up report.

Made up recorder #51.



#51 - 9/11/15-

Preliminary test  
Sharper than 58. About  
as loud. Clear, clear,  
distinct on voice. Plans  
clean but trifle sharp.  
Voice sharper (thunder)  
Stands out better. Cleaner.  
Voice announcement trifle  
sharper than 58. Shows  
ring. Clear, clear.

Voice

Plans

9/11/15-

#51 - 4 minute record.

Brass head. Domed Top.  
Knife Edge Pattern. 1/2" diam.

Diaphragm of Japanese paper  
impregnated with shellac  
.004". Disc of wood .017"  
1/8" fastened to outside.

Regular aluminum arm  
and .008" sapphire.

9/13/15

Made up recorder #57 and tested out. Preliminary test sounds good. Loud, free, stands out, clearer than 58. Triple sharps on voice clearer & cleaner on piano.

Mrs. Jas. S. Harper came about 11 AM & talked until 2 PM. He seems unable to hold himself to topic but talks about everything.

Mrs. Imgrund came in afternoon. Made following recorder tests =

- ✓ #58. Used as standard.
- ✓ #57 - Voice triple sharps. Piano sharp, shows ring & is clear.
- ✓ #54 - Voice louder than 57. Piano louder & purer more but clear & distinct. Natural.
- #69 - More muffled and back in horn. Does not ring as 57 or 54.
- #67 - Rings little more than 69 - much better on piano but not as good as 57 or 54.

#54 - Preliminary test.  
Round, full, natural.  
Voice shows trifle sharper  
and clearer and more  
distinct than #58. Piano  
shows little clearer and  
clearer.

Clarin - "Ponder (Kan 58) Stands  
out well. Natural, Good."  
Piano - "Voice (announcement) louder  
than 51. Piano louder &  
pung more but clear &  
distinct. Natural."

9/13/15

#54 - 4-minute record.

Brass Head, Domed Top.  
Knife Edge Pattern. 1 1/4" diameter.

Diaphragm of Japanese paper  
impregnated with shellac.  
.008" thick. Disc of wood  
1 3/16" diameter .020" thick at  
center turned off to feather edge  
shellacked to inside.

Regular aluminum arm and  
.008" sapphire.

#68 Slightly sharper than 67 or 69.  
but plups more and is  
clearer.

Voice  
#68 - Stands out well. Natural.

#51 - Triple sharper. Stands out  
better. Clearer.

#58 - Standard

✓ #54 - Louder. Stands out well.  
Natural. Good.

Piano - Regular set up.  
#54 - Plunkier on higher notes.

#68 - more muffled. Not as  
clear as 54 more plunkier

#51 - more natural than 68.

#58 - Plunkier. Better definition.  
#58 - Collected of the top. Does not  
stand out as well. Shows  
trifle of interference.

Then tried taking piano  
records under Grand Piano.  
Using angle horn. Top loud.  
② Using long horn #7. Personal.  
Rather natural. But not loud  
enough.

⑧ Using horn #7. Good  
but too loud in spots.

⑨ Small horn, instrument  
under piano. - Seems like  
music box. Delirious.

9/14/15.

Made up recorder #50 & tested out.

Shows up about like #54. - Clear, distinct - little sharper than #51 but less muffled. Tested out with Dawson. Clear & good.

Tried out Dawson on dictation. Does pronounce well yet and has slight stammer in his voice. Did better after awhile on dictation.

Made up recorder #52 & tested out with Miss Ingmund on piano. Seems to be fine. Very natural & shows ring of piano.

Miss Ingmund came in afternoon. Played for 1/2 hour most of the time. ~~Tested Recorder 50-52~~ against 68.

#52 has excellent surface - natural on piano and stands out of the horn better than any recorder I ever heard.

Made up recorder #44.

#50 Preliminary test.

Butte sharper than 50 last  
cleaner & more distinct

---

9/14/15.

#50 - 4 minute recorder

Brass head. Knife Edge  
Pattern.  $1\frac{1}{4}$ " diameter.

Diaphragm of Japanese  
paper - given coat of shellac  
on each side. Wood disc  
 $1\frac{1}{16} \times .015$  shellacked to outside  
and disc & diaphragm  
given further coat of  
shellac.

Regular aluminum arm  
and .008" sapphire.

9/15/52 <sup>Range</sup> #52 Rifle sharper than  
68 or 69 but cleaner and  
stands out. Plans most  
natural of all.

Voice - Big - natural - stands out.

Test by Miss Imgrund.  
Plans clearer, cleaner, voice  
natural - outstanding. Good  
to put color into a speaker,  
heavy or colorless voice.

9/16 - Sharper than 58. Stands out  
better and is more brilliant  
but has little patte (does not  
hold as well), "Good diction"  
"natural" - "clear".

9/12/52.

#52 - 1 minute recorder

Brass Head, Knife edge  
pattern, 1 1/4" diameter.

Diaphragm of Japanese  
paper given coat of  
shellac on each side &  
heated until dry. Disc  
of mica 1 3/64 x .005 shellacked  
to outside. Disc & diaphragm  
given coat of shellac.

Regular aluminum arm  
and .008" sapphire.



9/15/15 <sup>Comp</sup> Sharper than 68 or 69.  
Doesn't mill. Does not ring.  
~~size~~ Like 69 - Natural - feel  
- clean - good surface.

9/14/15

#44 - 4 minute record.  
Brass Stead. Knife edge  
Pattern - 1 1/4" diameter.

Diaphragm of Japanese  
paper given coat of shellac  
on both sides. Disc of  
mica .005" x 1 3/8" shellacked  
to outside. Disc & diaphragm  
given further coat of shellac.  
Regular aluminum arm and  
.008" sapphire.

9/15/15.

Made up recordings #s 67 x 69.  
and tested out.

Tested out following recordings  
with Mr. Dawson:

With Piano.

✓ #69 - Full, big, good diction. Stands  
out on voice. Quite persuasive  
Piano natural.

#68 - Full-voice phrase trifle more  
nasal or "whiney" than 69. Piano  
about the same.

#44 Sharper than either of above. Halls  
well. Piano trifle thinner &  
does not ring.

#52 Trifle sharper than 68 or 69  
but very clear and stands out  
Piano most natural of all.

High Voice.

✓ #52 - "Big" - natural - stands out.

#68 - Quite fuller & not quite so  
loud as stand out - so much.

✓ #69 Like 68. Natural. Fuller than  
52 but does not stand out  
as well. Shows tendency to

pians interference,  
#44 - Like 67. Natural. Feel - clean.  
Good surface.

Attended meeting at Mr. Leamings  
office on setting reproducers.

Miss Ingmund tested following  
recorders:

- Voice.  
#58 - Standard.  
#52 - Pians clearer-cleaner, voice  
natural, outstanding, good to  
put color into a somere,  
heavy or colorless voice.  
#68 - Quieter, more even than 52,  
more musical.  
#67 - Less Ring - weaker  
#54 -  
#57 - More sensative than 68.  
#69 - Less brilliant than 52.

Taylor "made up diaphragms  
of blotting paper. 3 of the  
reproducers seem good.

9/15/16 - #69 Pearl Full- hq.  
good diction. Stands out  
on piano. Little singing.  
Voice Like 68. Natural. Well  
than 52 but does not  
stand out as well. Tends  
to interfere on piano.  
"Less brilliant than 52"

9/15/15.  
#69. 4 minute record.

Brass head. Knife edge  
pattern -  $1\frac{1}{4}$ " diameter.

Diaphragm of Japanese  
paper, .004" given 3 coats  
shellac. Mica disc  
.005"  $\times 1\frac{1}{16}$ " shellacked to  
outside. Disc & diaphragm  
given further coat of  
shellac.

9/16/15-  
Tested out reproducers with  
blotting paper diaphragms made  
up by Taylor. 7 of these seem  
good.

Try next gaskets of cork compo  
marked

"Rubber Cork"  
From Paddock Cork Co.,  
1209 - DeKalb Ave.,  
Brooklyn, N.Y.

Made up records # 59 and  
tested out. Sounds weak and  
back in horn but fair  
quality and natural.

Mico Inguand came in  
afternoon. Tested out records  
for singing and for piano  
as follows:  
Piano.

#59 - Announcer voice rather sharp.  
Piano thin. Back in horn. Sounds  
well. Not pleasing quality. No echo  
well. Not loud.

#68 - ~~Unusually~~ voice not as clear.  
Piano bigger, fuller, more natural,  
louder.

Voice - Miss Ingrend.

#68 - Full - Natural - Clear - good surface.

#59 - Voice as loud & trifle more sharp  
but natural. Piano accompaniment  
not as loud. Also fine.

Voice - Mr. Dawson.

#59 - Somewhat back in horn. Shows  
metallic twinge. Not loud enough.  
Piano thin.

#58 - Fuller & bigger both on voice  
and on piano.

#52 - Sharper than 58. Stands out  
better & is more brilliant but has  
slight metallic twinge "good diction  
natural - clear".

#68 - Clearer than 58 more distinct. Not  
so metallic & sharp as 52 -  
natural - not as brilliant as  
52.

Voice - Mr. Dawson "Minor".

#58 - Used as standard - full -  
definition fair. piano natural  
"diction good - "natural" - good  
quality".

- #68 - Triple sharper than 58. Excellent diction. More fire and life in voice. Fully as loud. Good surface.
- #52 - Triple fuller than 68. Round and stands out. just a twinge "metallic" Pianos and voice clear & clean. "more outstanding - louder".
- #57 - Fuller than 68 or 52. Triple further back than 52 but natural and quiet. not so metallic - more musical. "less brilliant - less distinct - good quality".
- Piano Experiment - Machine high - #7 Horn pointed downwards & blow off.
- #58 - Little - plummy. Does not ring.
- #52 - Little but better definition & more natural. Horn closer to piano strings.
- #52 - Little better - louder & more ring.
- Horn still closer and in better focus -
- #52 - Little better - bigger & more ring.
- #69 - Big - Does not hold as well as 52. Shows blast. Back in horn.
- #58 - Big - Natural - Full - triple too much, so that it is dull - Blast.
- #59 - Neader than rest but back - natural - full - no blast - back in horn.

#59- Neaky - back in  
horn - than 68 but  
looks fine. Natural.  
Good for blast. not  
good for pole singing.

9/16/15.

#59- 4 minute recorder.

Grass Head, Domes Pop.  
Knife Edge Pattern.  $1\frac{1}{2}$ " diam.

Diaphragm of Japanese  
Paper. 2 coats shellac.  
Need disc .015" x  $1\frac{1}{16}$ " inside.  
Need Disc .002" x  $1\frac{1}{16}$ " outside  
than .002" x 1" even.  
Coat shellac even outside  
and inside after discs are  
applied.

New tapered aluminum arm  
and 508' sapphire.



[ITEM(S) FOUND IN BOOK]

What has become of the  
~~phone~~ The vocal chords

④ - Voice -  
Tone - very natural &  
good.

~~⑤~~  
⑤ - ~~lightest~~ angle horn  
natural but shows  
hammer blows

⑤ - angle horn 12"  
- too loud blasts

⑤ - angle horn - 19"  
- good and natural  
~~slight tendency to~~

⑤ - angle horn 21"  
good and natural

[ITEM(S) FOUND IN BOOK]

- ⑤8 - same closer  
- loud & blasty

58 - same 15"  
good and natural

65 - Voice

- Full - loud -  
big - stands out  
but inclined to  
blast

- ⑥2 - Voice -  
natural - good loud  
stands out

- ⑤8 - piano regular position  
Good & natural

- ④4 - piano regular -  
very full & natural  
but back in horn

- ⑤0 - piano regular  
very full natural  
more incisive than  
44 - goes to pieces  
on bass notes

- ⑤8 - <sup>close</sup> ante Horn Piano  
- very natural -  
loud good

[ITEM(S) FOUND IN BOOK]

58 - 18" - angle horn  
good and natural

59 - 19" - angle horn  
good and natural

60 - <sup>angle horn</sup> Rattles all 4  
pieces

60 - firm - soft  
rather natural  
spread

63 - Stands out - rather  
natural - join

60 - more natural - further  
back in horn. Very  
full & natural. Good.  
Surface via

51 - Angle horn - piece  
Natural tone but rattles  
on some notes

60 Voice - Natural & full  
slightly inclined to ~~ad~~

60 - Voice - Stands out  
well - better than 30  
but is not quite  
so natural - but  
still comparatively  
good.

**Notebook Series -- Notebooks by Edison and Other Experimenters  
Recorder and Recording Experiments -- A. M. Kennedy Books  
Notebook, N-15-09-17**

This notebook is a continuation of N-15-08-02.2. It was used by Absalom M. Kennedy during September-October 1915 as a daily record of experiments and tests with phonograph recorders and reproducer parts. The daily record is continued in N-15-10-21. The tests involve various recording machine parts and instruments, as well as variations in the positions of voices, instruments, recording horns, and cow-hair reflecting screens. Some of the tests relate to cylinder recorders. Kennedy's notes also describe other projects, such as his work for Miller Reese Hutchison on a wireless telephone system and the preparation of a two-minute recording of Hutchison for the Panama Pacific International Exposition in San Francisco. There are also references to setting up experiments at the Brooklyn Navy Yard in connection with Edison's work on the Naval Consulting Board. Other individuals involved in the phonograph experiments include E. Rowland Dawson, Clarence B. Hayes, William F. Nehr, R. H. Simpson, and George J. Werner. Some of the work was done on orders from Hutchison or Charles Edison. Other experiments were based on Edison's direct instructions and used recording horns designed by him. Two pages of comments and instructions by Edison have been inserted into the book. The front cover is labeled "Recording Experiments Book #5 From Sept. 17, 1915 To Oct 21, 1915." The pages are unnumbered, and several pages have been removed from the book. Approximately 110 pages have been used.

Sept. 17, 1915.

With Taylor finishing up model for casting for goose neck for Ambrosia 50 machine to adapt for D.C.S. Recording.

Made up Shellac with castor oil to prevent getting brittle and chipping. When the shellac and oil (small amount) is dissolved in wood alcohol and allowed to evaporate this seems successful. When the shellac and oil are heated together however, the mixture remains somewhat brittle and its strength as compared with pure shellac is impaired.

Made up powder # 50

9/17/15 - Piano, Neck, Back in  
form, finger sharp. "high  
notes lack tone"  
"voice" - weaker, sharper,  
further back in timbre  
no response to EP

9/17/15  
#55 - 4 minute recorder.

Grass head. Domed top.  
Knife edge pattern -  $1/16$  diam.

Diaphragm of Japanese  
paper - 2 coats shellac.  
On each side is shellacked  
2 discs of mica, net,  
to diaphragm .002" x  $1/16$ "  
and over it .002" x 1".  
Coat of shellac given  
direct and diaphragm.

Tapered aluminum arm  
and regular .008" gap.

9/17/15.

Miss Ingund came in  
afternoon. Tested records  
piano as follows:

- Piano
- #55 - Meak-back in horn, little  
sharp tone holds fair, <sup>high notes</sup> <sup>low tone</sup>  
#58 - Bigger & fuller <sup>sharp tone</sup> <sup>quality</sup>  
natural - holds as well as

55.

Voice

- #58 - Natural - full. slight piano  
interference. Deep tone  
quality - distinct not clear.  
#55 Meaker - sharper - further back  
in horn. Responds to high  
notes. Only fair on low notes.

"Back in horn"

Piano Experimental Reading

- #58 & Long Horn #2 - Small - weak  
plunky.  
#58 & Long Horn #1 - Bigger than  
#58 but no ring. Extraneous  
noise.

- 9/17/5-
- #58 x 2#7 Horns - No ring. Dead.  
Sawbo-like inward.
- #58 x both long horns - Rattles. goes  
to pieces but little more life  
than above.

Listened to Regg's Quartette  
- Record at night to compare with  
past =

- #68 - not as big or full or loud or  
natural to the do-58 but has  
better definition. Clear & clean.

Criticism of Balance:

Bass loud at first. Use  
saxons.

Baritone too loud. Also tenor  
on quart. parts. Bring Sop.  
parts closer to Horns.

Violin Record of this. Tenor phrases  
part. Almost triplets in  
accompaniment. Soprano  
holds to accents only. Separate  
voices stand out and express  
separate emotions. Note holds  
in time to accents.



9/18/15.

Worked on shellac with  
oil to make more flexible.  
When oil is mixed with alcohol  
and shellac this dissolved - this  
effect seems to take place.

When shellac is heated and oil  
mixed in later the resultant  
mass is still brittle and has  
less strength than the original  
shellac.

Mounted needles in arms.

9/20/15

Wrote up report.

Got ready for Diamond Disc  
Demonstrators. Machines -  
note Books - Catalogues etc.  
and saw them started off.

Tested out recorders for  
Quartile this afternoon

Got out small screens to  
put between singers to  
keep hold down interference.  
These are made of asbestos  
about 1/8" thick, 3' x 2' and  
hung between the horns.

Quartile came in afternoon.  
With Miss Rensen tried out  
pair of these "blindens" on  
solo -

# 69 - With blindens, Fuller &  
quite further back in horn  
than without - less tendency  
to blast.

Tried out #54 - good. also 69  
254. Last was the cleanest of  
the lot.

#58 without blenders was  
sharper and did not hold so  
well.

#58 with blenders stands out better  
and almost same fullness  
as without.

Mr. Boyle - Tenor -

R52 - Blenders - Clear & distinct

### Quartette.

#52 - Clear - Clean - Sharp.

#54 - Fuller & more natural

#69 - Fullest most natural.

#68 - Furthest back in horn  
Clean. No tendency to bleed

#58 - Natural - big - full but  
not so good enunciation  
this.

#51 - Neat. back in horn.

#58 - Stands out - full - big  
louder.

Mr. Boyle has good tenor  
voice which blends well with

the others. Did not know  
Quartette from Repetto or Trio from  
Pauk well but learn quickly.

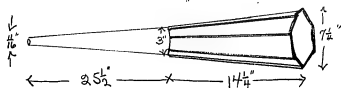
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Further study of records made  
with blinders as compared with  
those made without at night  
seems to show that these blinders  
simply confine each voice to its  
own horn so that horns do  
not pick up side sounds &  
interferences. In this way  
apparently can work closer  
without blast.

The records sound "a little more  
horny" & not as clear & brilliant  
as without blinders & do not  
sound as loud but on listening  
from distance they are as  
loud and clearer.

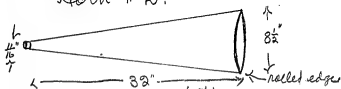
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Horn #1. X



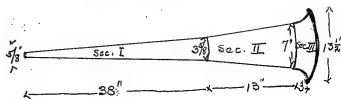
Small part of .017 zinc. Large part of .04 zinc. Folded edges rolled about 1/8" high. Mouth rolled about 1/8" diameter

Horn #2.



Made of .018 sheet tin  
black enamelled.  
Marked "Accepted Standard Amplifying  
Horn for Talking Machines".

# Horn # 8.



Section I. Copper .008"

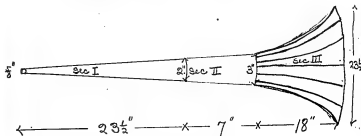
Section II. Sheet Tin .018" Black japanned.

Section III. Brass .0208" Rolled edge

Sections II & III from horn marked

Accepted Standard Amplifying Horn  
for Tackling Machines.

Form #5.



Section I Sheet Tin .020"

Section II, III from 12 section Triumph Horn

9/21/15-

Made up records #569 & 44  
and tested out.

With Mr. Dawson tested  
out #69, Records - open -  
with hard rubber and with  
asbestos blinders.

With Dawson

#69 - open - used as standard.

#69 with rubber blinders. Bigger,  
fuller & more natural both  
with voice and piano.

#69 with asbestos blinders - bigger  
& fuller than open but more  
muffled than with rubber  
blinders.

With Hayes =

#69 - open - used as standard.

#69 - with rubber blinders.  
fuller and more natural  
and true.

#69 - with asbestos blinds.  
fuller but dead.

Tested out following records  
to find poor ones to tear  
up and make over =



- #58 Used as standard. Full,  
natural but poor surface.
- #55 - <sup>Heel</sup> Sharper, back in horn,  
fringes, choked and muffled.  
<sup>Teas up.</sup>
- #69 - Full - clean - heels well -  
natural - <sup>Heel</sup>.
- #50 - <sup>Heel</sup> - back in horn - heels  
but thin - <sup>Teas up</sup>.
- #67 - Heel - muffled - back in  
horn - slight fringes <sup>Teas up</sup>.
- #59 - Full & true but back in  
horn - natural. <sup>Teas up</sup>.
- #51 - Little louder than 59 -  
natural - fair - <sup>Heel</sup>.
- #48 - Heels well. Round. Clean.  
Stands out. <sup>Heel</sup>.
- #44 - Does not heel - heels -  
stands out <sup>Teas up</sup>.
- #58 - <sup>Heel</sup> - <sup>Teas up</sup> for surface.  
Surface poor. But  
was over & improved  
a little but not good  
yet.

Miss Imgrund came in  
afternoon.  
Made tests to confirm use of  
blinders:

#52 Without Blinders

Mood - Clear - little weak-  
natural. Mr. D. Clear.

#52. With Blinders. Louder.

Stronger - Fuller - more natural  
both on voice & action.

#58 - Without blinders Weak -  
Back in horn.

With Blinders - Louder

much more natural

#67 - With blinders - Louder &  
fuller than without and  
shows tendency to least  
and holds down spots  
in voice.

The use of blinders makes  
the record fuller - louder -  
little further back in horn  
and seems to cover off  
or voice change or other  
defective spots in the voice

Reorder #1

Recorder #2 - 4 min.  
 Outside Diameter Head  $1\frac{9}{16}$ "  
 Diameter Diaphragm  $1\frac{9}{16}$ "  
 Thickness Diaphragm .002"  
 Material " Mica  
 Internal Diameter mica  $\frac{3}{4}$ "  
 Diameter Aluminum Disc  $1\frac{5}{16}$ "  
 Thickness " .004"  
 Arm Spread T section of aluminum  
 Arm Waxed to aluminum & edge of mica.

#50 - Loud - natural -  
Holds well. Fuller  
than 57. Sharper than  
67.

9/21/15  
#50 - 4 minute Recorder

Brass dead.  $1\frac{1}{4}$ " diam.  
Knife Edge pattern.

Jap. Paper Diaphragm. 1  
Coat shells each inside  
and out. Disc of mica  
 $1\frac{1}{16}$ " x .0025" shells set  
outside. Coat shells  
and diaphragm and  
disc.

Regular aluminum  
arch and .003" sapphire.

9/21/15.

Round - full - true - Compares well with #52 but not quite so sharp. Aged for further tests.

"Rate full & barrelly, Plans good and full".

(Miss D) As compared with #52 - "Diameter fuller - better surface".

9/21/15.

# 67 - 4 minute Record.

Brass head - Knife Edge Pattern -  $\frac{1}{4}$ " diameter.

Diaphragm of Japanese paper .001" thick. Given coat shellac on each side. Miss Diss .003"  $\times$   $1\frac{1}{16}$ " shellacked to outside. Coat shellac on diss and diaphragm.

Regular Aluminum arm and .008" sapphire.

#441 Does not feed well -  
fringes & blasts. Dead  
fish.

9/21/15.

#441 - 4 minute recorder.

Brass head, Knife Edge  
Pattern -  $1/4$ " diameter.

Diaphragm of Japanese  
Paper .001". Given coat  
of shellac inside & outside.  
Mica Disc .003" x  $1/16$ "  
shellacked to outside &  
~~coats~~ shellac over  
diaphragm & disc.

Regular aluminum  
arm and .008"  
sapphire.

9/29/5.

Made up records #50 & #58  
and tested out. #58 split diaphragm  
on tightening up.

Tested out the following records  
with Mr. Benson:

- #67 - Little full & hardly. Piano good  
and full. ent
- #52 - Sharper & cleaner & stands out.  
Natural.
- #50 - Trifle fuller than #52 but loud-  
clear & stands out. Good.
- #55 - Weaker than 52 or 55 but  
natural and bold. Little  
muffled.
- #69 - Louder than 55. Full and  
low. hardly. ent
- #58 - Full and natural. Some  
surface. Hard & well.

Then tested out #67 and #69  
records without and with  
blenders:



9/23/15

#67- With Blinders:  
Full & barrelly. Gives @  
sounds

#67- without Blinders:  
not so full. Much better.  
Truer. Clearer.

#69- With Blinders  
Full but better than 67

#69- Without Blinders  
Thinner and not so good.

From this it seems evident  
that the blinders improve a  
sharp thinner record and  
improve a record already  
full.

We have to try further  
to find the value of the  
blinders.

9/23/15.

Men in room to change  
windows. No work on  
records.

Outlined parts of history  
for demonstrators to see which  
Pinkeyson.

With Demonstrators in  
afternoon.

9/24/15 -

With Demonstrators all day.

Asked Mrs. Ingund in  
afternoon to make independent  
test of effects of blinders.

The reports

"With blinders - more sensitive  
and a little muffled"

"Without blinders - more natural  
substanting and clear"

Comparison Records

58 and 69

#58 - Deep quality, Round. Full. Rig.

#69 - More musical, Ringing  
Quality, good, more, better  
tone, better surface than 58.

Comparison of Records

67 with 58.

#58 - Clear, sharp, distinct

#67 - Sweeter, fuller, better surface

Test Record #69 with blunders.

- ① Blunders Close. Very big full,  
smooth, about as loud as  
without, a shade covered.
  - ② 6' Away - Smooth. Medium  
below 1 & 3
  - ③ ~~Without~~ - Rough
-

9/25/10

Examination of Demonstrators.

9/27/15.

Finished grading papers.

Note up report.

Quartette came in afternoon:

All records at first were  
poor - thin - hardly - muffled.  
Afterwards opened up windows  
and when temperature of the  
room was reduced, records  
became much better.

Tried out recorders 52-59-57-  
54-50. Used 50 for most  
work.

Tried with pinpoints.  
blinders. With blinders bigger  
and fuller than without.  
Nebert, thinner than with.

9/28/15-

In New York all day.  
Making up material for  
Brooklyn Navy Yard experiment  
at night.

9/29/15.

Made up records #50 after  
Mr. Edison's directions.

Listened to record of Mrs. Tellico.  
Is too loud and full for good  
recording.

Will have to be careful in  
future and get records not  
so loud & better quality &  
not sacrifice quality for  
loudness.

In discussion with Dawson  
and Hayes brought out  
that our quartette sang  
sings too loud that do they  
"holler" it out for effect  
whereas they should sing  
more softly and put the  
expression in it.



#51 Preliminary test.

Too soft and not so  
hard as 50 and is a  
trifle sharper.

9/29/15.

#51 - 1 minute record.

Brass Head - Knife edge  
pattern -  $1\frac{1}{2}$ " diameter.

Diaphragm - Japanese  
paper - 1 coat shellac each  
inside and outside -  
Cone of Cork  $1\frac{1}{16}$ " x  $\frac{1}{8}$ "  
shellacked to outside and  
whole given coats  
of shellac over cone  
and diaphragm.

Special arm of 004"  
aluminum sheet and  
028 wire. No fast  
but wired directly to  
cone. Regular 028"  
sapphire.

Made following tests of  
recorder

Mr. Dawson - 10"  
#50 - Big, full-bored, natural -  
clear - distinct. Pans  
clear.

" " Natural - action clear, surface good  
outstanding, loud. (Sawyer)

" Sharp - hard - open - piano good (Dawson)

#51 - Further back in horn. not  
as loud. Clear, natural.  
Tiple sharper. Pans natural  
but not so loud & further  
back.

\* Little more quiet than 50 - not as  
loud as 50. The characteristics about as  
Richer - more melodic, somewhat (Dawson)

#51 WITH BLINDERS. Pans and voice  
louder, fuller & more natural.

Seems to add more resonance  
Louder - clearer - (Dawson)

With Miss Englund  
#51 - With Blinders, Little weak  
a back in Horn - Natural.  
Clean. Even.

#51 - With Blinders. Apparently  
as good. Little cleaner than  
with blinders. Pans thin &  
lasts plunkky.

#50 - Big - full - Land. Stands  
out.

Tests of Mr. Edison's Horn.  
Mr. Dawson.

① #54 - Voice - musical. clear.  
clear. Piano clear. Trifle  
nasal.

#54 - With horn at #4.  
Voice - strong - nasal. Rough  
Buried. Unnatural. Sounds  
like pungi through horn.

#54 - With horn at 10°.  
Voice - only trifle louder than  
① but nasal & hoarse.

Test of Mr. Johnson & Son  
Mrs. Ingund.

#54 - Natural. Average Cond. - Clean.

#54 - Neck Horn. Nose unscured.  
Unnatural. Noisy. Nasal  
Awful. End.

#54 - Neck Horn. Mass Compressed.  
as before but little better  
action.

#54 - Neck Horn. Higher on face.  
not quite as bad as above.  
Action better but still bad  
horn quality.

Tests with Blenders

Mr Dawson -

① #54-10" - full voice  
stands out. <sup>big-bellows - rather hard</sup> Dawson

② #54-6" - softer voice.  
Bigger & fuller but on  
blast. <sup>stands more noticeable</sup> Dawson

③ #54-10" with blenders -  
not quite as loud as (2)  
but fuller than D. <sup>rather more</sup>  
<sup>yellow - more</sup>  
<sup>color - richer</sup>

Small & Long Horn  
#54 - with small horn #  
stands & blends out more  
than long horn below

#54 - with long horn #1 -  
thinner & better definition than  
above - not quite as loud -

Sept 30 - 1915

Made up records #59.

Spent morning with Simpson on reproduces question.

The greatest trouble Simpson has is division of authority. That he has not the purchase and inspection of his raw material and all stages of his product.

In general, he seems must have gone into the subject pretty thoroughly.

He has gotten up some very exact gauges for links and, for drafting linkins.

Not as loud as 58 but louder  
than 51. Duration not as good  
as 56.

9/30/15-  
#59- 1 minute recorder.

Brass Head - Domed Top  
Knife Edge pattern -  $1\frac{1}{2}$ " diam.

Diaphragm of Japanese Paper  
1 heavy coat shellac each  
inside and out.  
Cork cone  $1\frac{1}{16}$ " x  $\frac{7}{32}$ " shellacked  
to outside and coat of  
shellac over cone and  
diaphragm.

Special arm of "port"  
aluminum over .011"  
wire - no fast. waxed  
direct to cone. Regalan  
.008" sapphire.



10/1/15

Finished up warms #65 and  
tested out 65-80-81-87.

65 is land lead, very excellent  
diction.

88 is better than 65 - little more  
inclined to erupt - little less  
clear.

#87 - not quite as clear, diction  
not as good.

#87 - still less than 65, diction  
not as good as 65.

#65. Lens - stands out - clear,  
clear - no distortion any  
material.

10/1/5

#65 - 1 minute recorder.

Brass Head, Knife Edge Pattern.  
1 1/4" diameter.

Diaphragm - 1/2" brass Pipe  
up a two cuts of steel  
0.03" thick with 1/2" hole. Cork  
cone 1/2" dia. 1/2" thick to  
diaphragm. 1/2" dia. to  
steel cone diaphragm  
and cone.

Special arm, 1/2" 0.04" aluminum  
0.04" wire; photo fast.  
Regular 0.05" sapphire.

10/1/15.

Comparison R58 & oL  
Dawson

#58 - Feel - soft - good surface  
clean. Stacks well. Natural.  
Not as big as oL. Fringes on  
full & parts.

#64 - Louder than 58 - Better direction  
Stands out better - Rig - natural  
fine. Little sensitive & inclined  
to fringe

#65 - Sharper & break - more full - little  
horn tone

10/4/15.

Made up recorder #64 and tested out. This recorder is very full, sensitive, loud, natural. Should make good one for taking pictures.

Borrowed #9 Recorder from Geo. Harner and tested with stretched recorders. The stretched recorders have all qualities. Louder - not so loud - sharper gulls - clearer - more muffled. I do not see why we can not produce a stretched recorder to match any given recorder.

Miss Ingrenud came in the afternoon. Made the following data on recorders:

- ① #65 - Stands out. Quite sharp, but natural form and voice. Quiet. Good surface

#64 - More natural. Louder.  
Stands out. Triller. Good  
Piano. good sound.  
#58 Triller than 65. About  
same as 64. Not as loud  
as 64 or outstanding. Holds  
well.

Duet. Mixed. mtd. - Blinders  
#98 Little weak but very natural  
and holds fine. Duet - soft -  
musical.

#588 Stands out better - Louder -  
more open - not as musical  
and sweet.

#648 Clearer and more natural  
than #58. Triller and more  
muffled than #9.

Duet - Same. No Blinders

#9 - Triller back in Korn. Natural.  
Holds well. Triller louder  
than 54.

#54 - Not quite as loud as #9.  
Clearer - less muffled.  
Natural

Duet - Test of Blinders.

- #9- 3 Blinders.  
Bigger - fuller - than without  
blinders.  
#9- 1 Blinder.  
not as big or full as above -  
but little clearer & less  
horn tone.  
#9- Without Blinders -  
weaker, thinner & sharper  
than above.

Solo - Mr. D.

- #9- Full - natural - good definition.  
#67- Fuller - bigger - covered  
tone - not as good definition  
#69- Full - little muffled & horn  
tone - natural

Piano Experiment.

2 horns close.

- #9- Natural but little fringe of  
purple noise.  
#64- Louder - more ring - more  
natural.

Piano Experiment with  
blinders & side pieces

#50 - Feel & inclined to like it.

#50 - Thinner but cleaner & clearer.  
Pretty good, piano record.

Fairer! away without Blinders.  
#50 - Clean - clear - pretty good  
piano except not much  
ring.

#50 - WITH BLINDERS.  
more ring & bigger, fuller &  
sweeter & more musical.  
Ring dies away slower.

#65 - WITH BLINDERS  
Does not stand out as 50.  
Sounds lost in comparison.  
Only fair ring.

#65 - WITHOUT BLINDERS.  
Little clearer & sharper. Not  
quite so much ring.

#6H.

Prano Exp. 1 Horn.  
Reg but triple barrelly &  
not as good as white  
2 horns back.

#9-

not as big and loud  
as 6H.



Big - loud - stands out.  
Full - natural - clean.  
Seems better than SO on  
voice.

10/1/15.

#64 - L minute Recorder.

Brass head, domed top.  
Knife Edge Pattern -  $1\frac{1}{4}$ " diam.

Diaphragm of Japanese  
paper sheelaed on both  
sides. domed cork cone  
turned to fit dome  $1\frac{1}{8}$ "  
 $\times$   $\frac{1}{8}$ " - edge thin sheelaed  
to diaphragm and  
coats sheelaed over  
cork and diaphragm.

Regular aluminum arm  
and 008 saphire.

10/2/15.

In New York with Rehyless  
installing Kineto-phone at Grand  
Central Palace.

10/4/15.

Began on Report.

Listened to records with Hayes.

Laid out for Taylor, heard  
Seymour's dancing Phonograph  
on Chas. Edison.

Miss Kensen, Miss Fatio, Miss  
Imgrund & all present came in  
afternoon.

On account of absence of Mr. Rayle  
Pipette Quartette could not be  
done.

Made following trials -

<sup>Miss Kensen</sup>  
T 73° - 12' from horn. RSH-

#54 - Voice medium loud - trifle  
sharp - surface good - heels  
well - Round thin

#64 - Pans bigger and fuller - also  
voice - Heels better than above.

- #65 - Piano bigger than 54 - more natural & fuller on voice.  
Helds well. Soft. Musical
- #9 - Cleaner than 65. Piano but  
well - piano - good & full.

Quartette of

|             |     |
|-------------|-----|
| Abbeigate   | 10" |
| Miss Hates  | 8"  |
| Miss Rensen | 13" |
| McLusson    | 7"  |

- #9 - Somewhat muffled not clean  
diction not good.
- #54 - About same loudness but  
sharper than #9 cleaner.

Put each of the singers up  
an inch

#9 - Quite back and muffled.

#64 - Cleaner - clearer - louder - more  
natural - stands out.

10/6/15-

Finishing up report.

Inspecting Kinetophone films  
or Records of "Birth of the Kinetophone"

Laying out Chas. Edison Road  
Phonograph.

In New York inspecting work  
on Kinetophone installing for  
Western Electric Co.

- DAWSON'S - SUGGESTIONS -

10/6/15.

Finished up report.

With Taylor on Charlesons land  
Ose machine.

Discussing with Dawson his  
recording schemes. These are  
good and while in some cases  
novel are reasonable.  
Based on these want to try the  
following experiments:

- ① See effect of singing against  
side of horn slopping up the  
mouth.
- ② Make device for recording  
by longitudinal vibrations of  
a rod.
- ③ Try sectional horn to confine  
a sound out voice but thin  
out to prevent being too loud.  
Also one with cloth over head  
to confine & use all tones.
- ④ Try sound on horn to show  
resonance.

- ⑤ Try piano recording with  
several horns of different  
sizes.

Miss Buckinder and Miss  
Miss Impey came in  
afternoon. I put out recorders  
which Miss B. also worked  
Miss B out on recording.  
trying to show her what to  
guard against.

Made following recording tests.

#67 - (My. Shaded ~~Standard~~) Standard.

#54 - Not as clean and clear as  
Std. Fuller, natural.

#52 - Diction not as good as 67  
Little sharper.

#9 - Fuller more mellow than Std.  
musical. Not as sharp

Cylinder #2.

#68 - not loud as Std. Back in  
horn. Clean.

= Std. Standard

#58 - Full. Not as loud as Std.  
not as clean & clear. Diction  
not as good.

- #9 - Rich - full - natural - does not stand out as Std. but not badly back in horn.  
 #54 - Very close to standard. About as bud. Clean & natural.

- Cylinder #3 -  
 Std. Standard

- #9 - More even & natural than Standard - Heads better. Trifle fuller.  
 #54 - Diction good. Heads better than Standard. Rather mealy. <sup>Reckoned</sup>  
 On these 2 years I picked Std. as best. 4 picked 9 & 1 " 54.

Cylinder #4 -

- #67 - Standard -  
 #64 - Not as loud. Heads better - not so even any throughout register.  
 #9 - Firm, even. little interference. Not as clean as 64.  
 #58 - Fine. Heads well. Scales good even mealy tone.  
 #57 - Cleanest - Good heads well chored better than 58 but not so big & full natural.



Cylinder #5

Duct

#54 - Clean - clear. Holds.

#54. Rubber - shows interference.  
Stands out better, more  
natural.

#64 - Good - natural - holds.

Rest balance on Duct

mass B - 8"

mw, D - 12"

Temperature 72°

10/7/14  
Piano Test of Records  
T 72°

Cylinders #1

- ① - 9 - Full. Natural. Holds. Surface good. Ring fair.
- ② - 14 - Kind. Fuller. more natural and nice ring. Surface good. Ring fine, fringed.
- ③ - 52 - as loud or louder than 14. does not hold as well. Fuller. more natural. Slight fringes. Ring excellent. Surface excellent.
- ④ - 64 - Big. full. Excellent ring. Excellent surface. Very natural. Holds better than 52 & does not fringe.
- ⑤ - 50 - Big, full. Fine ring, surface good. Holds better than 52 but not as well as 64.
- ⑥ - 68 - Not as loud or as much ring as 52-64 or 50 - little plunkier. Fuller surface. Holds well.
- ⑦ - 58 - Bigger & louder than 68 but not as much as 50 - more woody tone, little surface plunk.

10/7/15

Cylinders #2

- ①-58 - Back in horn. Surface fair. Fair ring only. Sounds quite plunky.
- ②-68 - Weaker & back. Surface shows. Halo. Fair ring. Big. full. Loud. Made this time. Rings. Surface good.
- ③-50 - Not quite as big as 58 but still natural. Halo better than 58. Surface good.
- ④-52 - Big. full - but gives strained sound to strings. Surface good.
- ⑤-51, Does not stand out as much Halo. Sounds more covered but full and natural.
- ⑥-9 Halo fine. Covered. Not as clear as 50-64 or 52. Natural. Surface good.

10/7/15

Cylinder #3

Spring Song - Piano.

Regular S.T. up  
R&H - and Standard. Standard is  
better. May not be so clean  
but is bigger and more natural  
and has the heavy notes

Cylinder #4

Spring Song - Piano.

Same as above except screen  
put behind piano.  
R - Std & 50. Standard is more  
covered but richer & more more  
mellow.

Test of Mr. Edison  
Experimental Horn.

- ① Regular Resonating
- ② With Experimental Horn.

This horn responds naturally  
to F. and with recorder seems  
to respond to other notes.

It is not as loud as regular  
#7 horn and requires singing  
closer in.

10/7/15-

Queer pronounced horn tones  
and by responding to certain  
notes is not even.

Test of Mr. Edison's  
Megaphone Horn.

Miss Imgrund sang in #7  
horn without amp then  
with megaphone horn.

Record showed that this  
horn did not increase  
volume but did improve the  
pitch in the case of Miss  
Imgrund by bringing out  
the head and nasal tones.

10/2/5.

Finished up Glas-Gison's loud  
diamond disc machine.

Made up recorder #68. First  
diaphragm broke. Second O.K.  
This recorder is weak and tufa  
thin.

Miss Ingmund came in afternoon.

Tested recorders as per previous  
pages

10/7/15  
#68 - 4 min recorder.

Brass head. Knife Edge  
Pattern.  $1\frac{1}{4}$ " diameter.

Diaphragm of Japanese paper  
15x4  
saturated shellac - about 20 ft.  
Cork core, turned & fit dome,  
cutt thick on edges, fastened  
to outside with shellac, and  
core and diaphragm given  
coat of shellac.

Regular aluminum wire  
and .008" sapphire.

Rather weak. Back in form.  
Hoeds well. Triple thin.

10/8/15

Test Readers:

- # Std. - Very loud. Full. Big. Some time.  
Hoeds. Distortion good.
- # 55 (new) - Not as loud. Triple sharper.  
Hoeds better. Natural.
- # 9 - Little louder. "Healy". Little  
fuller than 55. Natural. Little  
back in form.
- # 58 - Little tuning. Not as firm.  
Natural. Little fuller than 55.



10/8/5  
Quartette Reording

T 74°

- #9 - Singing not as loud as before.  
Should more expression -  
smoother - more dramatic  
than we have done in some time.

A 10.

F 9

R 14

T 4

- 
- #55 - All closed up -

A - 9

F - 8

R - 12

T - 3

Still not quite loud enough -  
Smoother & more even than  
before. Balance ju's.

---

10/8/5-

Tried out Rhodius #54 without  
Blinders and again with blinders  
on quartette singing Solenne  
Chorus from Faust.

With blinders the effect is  
pronounced - bigger, louder  
faster and at the same time  
fleece.

Tried same with jockey #50  
but this does not head as  
well as 54 - is much less #54  
is nearly as loud and is  
clearer and clearer more  
distinct.

Quartette did good work this  
afternoon. Sang with a great  
deal more expression -  
put intelligence and energy  
into it.

Preliminary Trial. Scales were  
natural. Rifle sharper  
than #9 & not as muddy.

Tried out on Swatilla 10/6/15.  
Not as loud or stand out as  
well as #9. Very clean &  
good surface but knife weak  
and back in horn.

---

10/8/15-

#55 - L minute recorder.

Brass Head, Domed Top.  
Knife Edge pattern -  $1\frac{1}{4}$ " diam.

Diaphragm of Japanese  
paper given two coats  
shellac. Cork cone  
 $1\frac{1}{2} \times \frac{1}{8}$  turned to fit  
dome and shellacked to  
inside of diaphragm.  
Cone and diaphragm given  
coat shellac all over.

Regular aluminum arm  
and .008" sapphire.

10/9/15

Worked on Dawson's longilabris  
vibration recorder and made  
preliminary test. Very weak -  
too much for use.

10/11/15.

Note up report.

Saw Nkr and Nermus about  
getting Kinetophone record on  
Disc for Chas. Dixon.

Experiment with Mr. Dawson  
on stopping end of Horn and  
singing through metal of Horn.

Proved that this could be done.  
Piano fairly natural. Saise as  
if at end of big room.

Sang and played into various  
Horns and tried to find to  
which notes they responded.

Took two of them singing  
with piano to see if they would  
record this note on records. They  
did not.

Test of Horns -

#7 Stand alone -

#6 - Trifle fuller but close.

Little difference.

#12 - Little fuller than #7 - Piano does

not come out as loud - sounds  
lost.

#11 - Louder than L2 Bigger.  
Bans - louder & clearer.  
About same as #7.

#4 - not as loud as L1, not as  
big. Full.

#6 Bigger - Louder than #4, clean  
full good cleaner.

Mr. Dawson comments  
#7. Stands out well. Good  
quality.

#6 (smaller) Not as clean as #7  
otherwise little difference

#2 Song, Fuller than both 6 & 7  
Not as clean as 6

#1 Song Very much like #2 Song  
Only more so

#4 short - Little muffled but  
good quality.

#6 ~~139~~ Dull but quality  
otherwise good.

10/12/15.

Experiment with Dawsons  
Auxiliary Horn.

- ① T72° R5H #7 Horn - 9"  
① Regular. Used as Standard.  
② With auxiliary horn. Fonder  
but shows "squaks" or loud  
spots. Not as even and  
solid as without.

This horn was 7" diam to 9" diam  
x 10" long.

Then tried with smaller auxiliary  
horn. Made record sharper  
and "squakier".



Auxiliary  
Horn.  
Cast lined.

Regular Horn.

Made up recorder #70 - Very  
full & natural but weak &  
buckin horn.

Preliminary Test =

Weak, soft, back in horn  
but very full in tone and  
very natural especially  
piano.

"not as loud as #9. soft, full,  
rich mellow, sweet musical.  
Piano sounds well"

10/10/15

#70 - 1 min recorder.

Brass Head - Knife edge  
pattern.  $1\frac{1}{4}$ " diameter.

Diaphragm of Jap Paper  
& thin coats Shellac.  
Cork cone  $\frac{3}{16}$ " x  $\frac{1}{16}$ "  
shellacked to outside  
and coat of shellac given  
cork and diaphragm.  
(Notice that diaphragm has  
only little movement  
inward before striking  
head, proving that shellac  
on surface of showing  
cork inward)

Regular aluminum arm  
and .008" sapphire.



Treble louder, more brilliant  
and sharper than 70. Rattle harder  
Tone. Piano good. Definition  
excellent.

10/12/15.

#71 - 4 minute recorder.

Brass head - Knife edge  
pattern -  $1\frac{1}{4}$ " diameter.

Diaphragm of Jap. Paper  
2 thin coats shellac. Cork  
cone  $1\frac{1}{2} \times \frac{3}{32}$ " shellacked to  
outside and 2 coats of  
shellac over cone and  
diaphragm.

Regular aluminium arm  
and .008" sapphire.

10/13/15.

Made up recorders 72 and 73.

Got ready for 2 minute record of MPT for San Francisco Exposition.

Saw about film for Marnes.

Made record of MPT for San Francisco.

Quartette came in afternoon. Mr. Stricklett as new tenor. After trials made records of Quartette without and with blinders and masters for same.

The effect of the blinders is to make records bigger and fuller but, curiously, to cut down tendency to be irregular in spots. Record without blinders however is sharper and cleaner and apparently stands out more than with.

#72 Little praker speller than  
#71 but inclined to be  
metallic. Some horn tone.

" Louder than #71 - clear - good  
diction - clear - quiet - standard.

10/13/15.

#72 - 4 min records.

Brass Head - Knife Edge  
pattern -  $1\frac{1}{4}$ " diameter.

Diaphragm of Japanese Paper,  
9 coats phellac. Cork cone  
 $1\frac{1}{2} \times \frac{1}{16}$ " phellacked on outside  
and cone and diaphragm  
given two coats phellac.

Regular aluminum arm  
and .008" sapphire.

#73 Very close to #9 - about  
as loud and full but not  
quite as firm

Net as loud and clear as 72.  
More muffled & hurried.  
Net as clear. Soft & melodious.  
more mealy, staccato fine.

10/12/15.

#73 - 4 min. recorder.

Brass Head - Knife Edge  
pattern. -  $1/4$ " diameter.

Diaphragm of Jap. Paper  
given 2 coats, phillars. Cork  
Cone,  $1/16$ " &  $1/16$ " - phillars to  
outside and cone and  
diaphragm given 2 coats  
phillars.

Regular aluminium arm and  
.008" sapphire.

10/18/15.

Mr. Stricklett's voice blends  
well with others. 1/2 months  
his words somewhat too  
much in solo work but  
in straight quartette is  
good.

---

Tried out 7 minute recorders  
#56 & 61 against 74 on  
2 min records for mp. t.  
#61 better than #56. Both  
louder and sharper than  
74 which is more nearly  
these recorders have stood  
up fine though some on  
amp. t.

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10/14/15-

With Demonstrators all day.

10/15/15  
with Demonstrators all day.

10/16/12  
Examining Demonstrators.

Sketches recording stunt  
for Telephone Transmission.



10/17/15.

Hutchinson's Record for  
Telephonic Transmission.

10/18/15.

Correcting Examinations.

Repairing Records.

Preparing for Hutchinson's  
Telephone transmission stunt

10/19/15.

Miss Mr. Dawson tested the following  
records:

- #9 Used as Standard. Good-Full.  
Natural. Sweet.
- #70 - Not quite as loud. Soft, full, rich,  
mellow, sweet musical. Piano  
sounds sweet.
- #71 - Trifle louder, more brilliant and  
sharper than #70. Little harder tone.  
Piano good. Definition excellent.
- #72 - Little richer and fuller than 71 but  
more inclined to be metallic. Some  
horn tone.
- #73 - Very close to #9 - about as loud and  
full, but not quite as firm  
perhaps.
- #54 - Louder than #9 and stands out  
better. Trifle sharper and more  
metallic. Shows trifle more  
horn tone.

Test of Cow Hair against  
Reflecting Screens.

#54 with cow hair screens around



- = cloth screen  
to deaden sound
- = heavier board screen  
to reflect sound

① As above, used as standard



② As above.

Prefer more even & level in tone  
and more natural.

Dawson says

"With reflecting screens, tone  
seems freer - not as restrained  
but timbre, while more brilliant  
is not quite as rich".

### Test with Luller Helmet

① Without R54 as standard

② With helmet. 1st test little farther away, not quite as loud, softer, richer, bigger fuller tones, but lacked the brilliancy & crispness & distinctness of without.

2nd test both 10'. With was louder fuller and had some heavily tone.

Will feel out records probably as Viburnos do when used at correct distance.

Test of Records to repair or tear up.

#9 - Used as standard.

#50 - Rig. qv. - louder. Fuller more piano. Horn tone phonon. Does not hold as well.

#51 - Very weak & back. Trifle sharp in back of overtones.

#65 - Loud enough, rich, holds well  
trifle back in horn. Slight  
metallic. Slightly barely.

#59 - Not as loud. Holds well.  
musical & mealy. Slight horn  
tone, lacks brilliance

#58 - Loud. Full. Stands out -  
some surface. Slight horn  
tone. natural. Best as loud

#44 - Loud - Big - Full - Little  
metallic - Horn tone - Sensation  
heavily lustrous.

? #60 - Loud - Full - Rich - Holds  
well - not brilliant - only  
slight horn tone.

? #67 - Loud - big - full, trifle more  
full than above. Slight  
horn tone. Piano fine

#55 - Heavier & back in horn.  
Shinner, Holds well. No  
horn tone.

#64 - Fairly loud. Full - natural.  
Holds well - slight horn  
tone tendency.

✓ #52 - Loud - little sharper. Piano  
loud & sharper. Clean. Holds.  
Little metallic.

✓ #57 - Loud - mellow. Full - clean.  
holds well. no horn tone.

### Same with Piano

#9 - Used as standard. Holds  
well - tones natural. Good ring.

#50 - Loud - big full lust holds,  
Big ring. Natural.

#51 - Not as loud, Full & natural.  
Holds everything. Too soft.

#65 - Little louder than 57. Full  
very soft musical

#59 - Natural. Fairly loud. Holds  
musical.

#58 - Loud. Full. Holds well -  
Big tone - Best yet.

- #44 - Loud Big - full - little  
rattle. Very natural on  
easy stuff.
- #60 - Fairly loud but not as  
loud as 44. Shows little  
blast, natural on softer parts.
- #67 - Loud. Holds starts out.  
Slight blast.
- #55 - Sharper. Not so big &  
full & natural.
- #57 - Loud - full - natural - holds  
well. Good ring. Holds.
- #52 - Big - full but little rattle
- #64 - Natural - Big - full.

Tests of Records with  
Mike Buchbinder.

- #9 - Piano - natural. Voice little  
back. Clean, natural. Full.  
Holds well.
- #70 - Just, not quite as loud as #9  
Surface fine. Fine diction  
not as brilliant or as much  
life, trill uneven from moving  
back & forth.  
Compares well with #9.



#71 - Piano does not stand out as well. Voice sounds more buried than either of former.

✓ #72 - Natural but not a good diction. Powder. Clear. Good diction. Clean, quiet. stands out.

✓ #73 - Not as loud and clear as 72 more muffled and buried. Not as clean. Soft melodious more mealy. Holds fine.

#74 - Big & fuller than any of the above. Buried than above.

Test with & without helmet.  
① Without. Clearer - clearer

② With helmet. Muffled.

Dust Mrs B & Mr D.

① Without helmet - Clearer - Clearer

② With helmet - Not as clear as

Experiment Cow-Hair  
Screens against Reflector

- ① With Cow-Hair Screens standard.
- ② With Reflecting Screens. Shows little  
louder full & piano. Voices  
all louder & more natural.
- ③ With Small Blinders. Trifle fuller  
but not as clear & clear. Shows  
OO tones in 7 places.
- ④ With Large Blinders. Not as loud  
but separates voices excellently

Quartette Test with  
Large Blinders

Used Miss Bushblinder, Miss Ingrid  
Hays & Dawson with H<sub>2</sub> & H<sub>2</sub>  
Reddy's Board Blinders.

This quartet was not loud  
but gave the finest quartette  
I ever heard on the Phonograph.  
Absolutely no interference.  
Everything clean.

Piano <sup>10/20/15</sup> Test With and Without  
Reflectors.

- ① With  $40 \times 40$  Beaver Board  
Reflector -

Too long. Shows interference and  
blast but good long ring.

- ② Without. Not so loud. No blast  
but, more of the "plunkety"  
effect, lacks ring.

Pianos moved back to  
greater distance

- ① With reflector -  
Shows a metallic rattle &  
interference.

- ② Without reflector - nearer &  
plunkety.

Same With Cow Hair Screens  
behind in place of Beaver Board

With reflector shows more ring  
than without.

Cow Hair Sevens Working at  
Standard Distance & Set

Slightly louder than before. With  
Reflector shows more ring and better  
than without.

As above but with horn raised  
Reflector raised so as to more nearly  
reflect in horn.

With reflector, best yet. more  
natural & true & better ring than  
without

With Large Reflector alone  
same -

Not as good as with smaller  
reflector alone, though with reflector  
was better than without. This  
may be because of the converse  
effect of the smaller reflector.

With Small Reflector, piano  
parallel with horn,

Lower than with piano in  
usual position - Reflector shows  
comparatively very loud. Reflector  
was put in position to reflect  
maximum waves.

Same with Reflector more  
nearly vertical.

Good, not too loud & blasty,  
true tone. Reflector shows  
advantage in rings

Same with Piano Subways

Shows much & with interference  
Better here without reflector

Piano Experiment  
Horseshoe Crab Horn  
12" from piano connected  
to machine by 42 rubber  
tubing.

1st part of record, Mopkewski  
Serenade. Fine. Still natural  
no part. Righmanoff's Prelude -  
Reacts throughout.

Same as above but no part  
horn raised to 24".

Little or no apparent difference

Part 2 of above with horn  
3'-6" from Piano.

Does not show jump outs but  
does show bad interference &  
unpleasant

Same, Horn connected to  
piano with 16" tubing. 12"  
from Piano

Comparison H.S. Horn @ 12" & 18"  
12" louder & fuller, 18" little more  
plunky.

As above with H.S. Horn at  
18" without & with reflector.

The reflector, seems to make  
softer, more mellow and even.

As above with H.S. horn at  
12", without & with reflector.

The reflector seems to make the  
tone more mellow & note so  
clear & distinct.

### NOTE

#### Things Learned

- ① Use of large heavy board, blinders  
gives quartette records without  
interference
- ② Long rubber tube between horn  
and machine increases fullness  
and tendency to blast
- ③ Records can be made through  
rubber tube
- ④ That the heavy board screens

Recorder # 74 - 7 min  
 Outside Diameter  $1\frac{1}{8}"$   
 Diameter Diaphragm  $1\frac{1}{16}"$   
 Thickness Diaphragm .0015"  
 Material Diaphragm Mica  
 Internal Diameter Mica  $\frac{9}{16}"$   
 Diameter Aluminum Disc  $1\frac{1}{16}"$   
 Thickness .006"  
 Regular Arm "Shell" fixed to aluminum  
 and to edge of mica.



Recorder #10 - Lmin.

Outside Diameter Head

2"

Diameter Diaphragm

1 1/2"

Thickness Diaphragm

.00175"

Material Diaphragm Acetyl Cellulose 50% <sup>(B)</sup> Acetyl

Aluminum Disc, flat, waxed to center of

diaphragm 1 7/8" x .0065"

Regular arm waxed center & end.

Needle .008"

Diaphragm stretched by cooling.

#50 Too sensitive  
Tighten Diaphragm ①  
Add Buffer or wax ②

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#51. Too weak - Make even.

---

#65. Back in horn & handle.  
Try tightening.

---

#59 - Dull & lacks brilliance.  
Tighten.

---

#58 - Hard or Coarse tone. Not rich.  
Surface.  
Flatten sapphire

---

#44 - Sensitive, Tendency to blast  
Put on wax or cork buffer.

---

#60 - Fair. Need for further test

---

#67 - Fair - Need for further test

behind the piano gave rattles,  
& interference which were eliminated  
by cow haw saram behind.

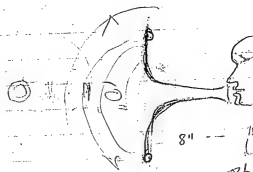
[ITEM(S) FOUND IN BOOK]

Kennedy

Make  
①

Corrugated to stiffen

Tin - heavy gauge

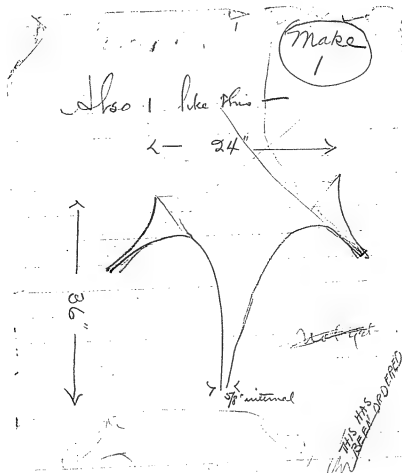


8" -- Mouth piece  
helps firmness  
speaking  
- trumpet

Make one - Have singer

Sing without a then succeed  
trumpet horn funnel 8" the  
length of horn - sing again same  
Vacuum

[ITEM(S) FOUND IN BOOK]



Get 15 feet of the  
flexible metallic tubing  
used for steam without sockets  
1 1/2 inch inside diameter. Hanger  
will tell you where to get it.

[ITEM(S) FOUND IN BOOK]

- Singing against side of
- ① Horn. Stop mouth
  - ② ~~Place~~ <sup>Stiff</sup> Diaphragm  
to Still Rod + record  
in this way
  - ③ Fibre board  
head horn
  - ④ Dry sand on horn  
to determine resonance
  - ⑤ Plans recording with  
several horns of different  
shapes & sizes

[ITEM(S) FOUND IN BOOK]

- ① Resonance to sing means overtones & not the ability of one body to impress its vibrations upon another sonorous body which is in sympathy with it.

Horn sound in records may be caused by horn vibrating. Try deadening the horn by touching cut edge and half way between. Sound should go direct from singer to recorder with any interfering vibrations between.

Could vibrations be transmitted to recorder by metallic means instead of air currents. Try singing against side of horn. Might have large metal diaphragm constructed similarly to recorder and connected with it by a thin steel rod instead of a horn as at present. Object being to eliminate horn sound.

Is there any material difference between sound waves and water waves. There being practically no way to tell how sound waves act in the interval

[ITEM(S) FOUND IN BOOK]

between leaving singer and entering recorder, it might be possible to put two blinders in water thus



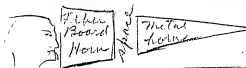
or half submerge a horn and after allowing water to become perfectly still, drop object in water about A and watch action of waves entering horn etc,

Round waves should be caught directly they leave the singer and rounded. However it has been shown the recorder will not stand full force of all the vibrations such as would be obtained by singing directly into the mouth of the horn. Therefore why not have segment of fiber board horn size & position of which would be continuation of metal horn, which would catch sound as it leaves the singer but with a space

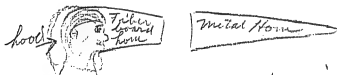


[ITEM(S) FOUND IN BOOK]

- ⑦ intervening between the two to allow excess vibrations which are not wanted to escape. Thus:



Or possibly instead of F.B. horn suspended as above, have a horn which would fit over the face of singer fastened to his head and with cloth attached that would come down over his head like a hood. Thus all tone waves would be caught and rounded before going into horn.



This arrangement might succeed in getting more nasal overtones into recorder without the brassy nasal sound the fireman's horn produced.

[ITEM(S) FOUND IN BOOK]

Horn has a definite pitch as may be seen by striking it. Certain tones will cause it to vibrate in sympathy. These tones would produce more resonance (physical) than other tones and consequently project waves with greater force into recorder. Can that be the cause of blasts and the bad sounds produced by certain chords on the piano?

Ideal horn would be one of great plasticity and a super-human brain, that could anticipate each tone that is to be precipitated into it, and adjust itself into such size and shape that would be suitable therefor.

Could sand be used in any way to determine when horn is in sympathy with the tone and when not.

What is a soap film

[ITEM(S) FOUND IN BOOK]

- ③ Violins all have their particular pitch  $C_3$  but by much experimenting it has been made almost imperceptible and in playing a scale is not noticeable. Horns and recorders must have theirs too & these must also be made imperceptible. Are they now? Might not this cause the bad sounds noticeable on certain chords of piano. Or might not the fault be in the present construction of the piano, not noticeable to our ear but effective on the recorder.

Our ear passage also has its pitch and some notes seems more cutting to us in consequence than others.

Something of this sort is very noticeable in piano records. Friday I noticed the upper and lower registers some much clearer and penetrating than the middle register. Possibly the horns used were in sympathy with these registers. Perhaps a horn of different shape and size would be sympathetic with the middle register. Maybe the trouble could be helped by using several horns of different shapes and sizes.

[ITEM(S) FOUND IN BOOK]

- 54 ① Natural - little back in horn. Hairs fine.  
diction good.
- 55 ② - not as loud - Gripe sharper - Hairs fine  
natural - back ~~back~~
- 9 ✓ ③ - Triple louder than 2 - Guller than 2 -  
natural - back in horn
- 59 ④ - better twing. Natural - not as fine



**Notebook Series -- Notebooks by Edison and Other Experimenters  
Recorder and Recording Experiments -- A. M. Kennedy Books  
Notebook, N-15-10-21**

This notebook is a continuation of N-15-09-17. It was used by Absalom M. Kennedy during October-November 1915 as a daily record of experiments and tests with phonograph recorders and reproducers. An additional entry from May 1916 appears at the end of the book. The tests involve various recording machine parts and instruments, as well as variations in the positions of instruments, recording horns, and reflecting screens. Also included are tests of cylinder records reproduced from disc masters. Some of the entries describe other work by Kennedy, such as training Diamond Disc demonstrators and preparing for a showing of "The Birth of the Telephone," a kinetophone film about Alexander Graham Bell. Some of the tests performed by Kennedy were based on Edison's direct instructions, including a series of horn and recorder tests described in N-15-11-19 (Recorder and Recording Experiments--Miscellaneous Books). The notes indicate that Edison listened to several of the recordings and gave comments and further instructions and that some of the work was done to assist William V. Dinwiddie and Miller Reese Hutchison. Other individuals involved in the experiments include E. Rowland Dawson, Clarence B. Hayes, Charles W. Luhr, R. H. Simpson, George J. Werner, and experimenters named Cook, Smith, and Taylor (probably Henry A. Taylor). The front cover is labeled "Recording Experiments Book #6 From Oct. 21, 1915." The pages are unnumbered, and several pages have been removed from the book. Approximately 60 pages have been used.

10/21/5-

Teaching Diamond Dese Demonstrates  
all morning.

Getting ready for Bee Tel.  
show in afternoon

10/29/15

Teaching Diamonds Duckumont-  
nats all morning.

Quartette came in afternoon.  
Work better together with  
new tenor.

Made trials with #9 9.5L  
and 72 recorders. #52 shows  
sharper and does not lose  
quite as well. #72 sounds  
little more muffled than  
#9 - 9 decided on as best.

Made 2 masters for  
blue records one with  
Large Beaver Board Records,  
one without.

Tried Trio from Faust - Miss  
Rosen whistled too hard in  
this and showed it in her  
voice. Mr. Street also did  
not know part, not good  
enough for Master.

10/28/15.

Teaching Diamond Disc  
Demonstrators.



10/25/15

With Diamond Disc  
~~Demonstrator~~ all day  
morning teaching - afternoon  
examining.

① Shows up piano fine -  
full & round & natural.  
Lead in period but  
without interference.

② About same as above  
but with piano a  
little more muffled.

③ Makes him too weak and  
back in horn.

④ Makes him too full. muffs  
voice & kills the clearness  
& distinctness.

10/26/15

Assist Timmidge in  
Removal of hydrogen test.

Recording Experiments -

Tested:

① Reflecting screen just behind  
singers. Piano behind screen  
with Kraschke Crab. Horn  
connected to recording  
machine with 12' pure  
gum  $\frac{5}{8}$ " tubing.

② Same as before but with  
reflectors a little further  
back.

③ Tied 12' gummed tube between  
bass horn & recording  
machine.

④ Tied 12' similar tube between  
Soprano and recording machine,  
close up.

- ⑤ ~~Little~~ sharper & cleaner  
and louder. Not as full  
and big as ~~much~~ ~~shape~~  
- ~~shape~~ crab horn
- ⑥ Reflectors made record, louder,  
bigger and fuller at the  
expense of clearness &  
cleaness - made it  
also ~~stand~~ out of horn  
better. Without reflectors,  
thinner, clearer, & not  
as loud & further back in  
horn.
- ⑦ With crab horn only - weak,  
full, natural, very sweet and  
musical.

- ⑤ Tried angle horn on piano  
in place of Horseshoe Crab  
horn.
- ⑥ Comparative experiment, reflectors  
close behind singers and in  
regular place.
- ⑦ Piano record with 2 horns and  
Horseshoe crab horn & 12"  
tube - and with crab horn  
only.

✓ #50 - Tighten up to make less  
sensitive & cleaner. *(much  
simpler)*

#54 - Leave temporarily.

#57 - Build over, putting  
on less dampers.

#44 - Tighten up to make  
sharper & less sensitive.

#65 - Leave temporarily.

#57 - " "

#59 - " "

10/27/57

#9 Used as Standard

✓ #50 - Powder, tendency to go to pieces  
bigger. Fuller

✓ #54 - Not as loud & full as 50 -  
Holds better. Packs definition  
& shows trifle rattle.

\* #57 - Packs volume - Horn tone -  
back in Horn. Quality fair.

#44 - Loud, big, stands out  
Piano good. Full.

✓ #65 - Average loudness. not  
sensitive. Good quality.

#57 - Full - fairly loud - natural.

#59 - Trifle sharper. Holds  
well. Little back in  
Horn.

#52 - Tighten up -

#73 - Tighten up to make  
sharper

#67 - Tighten up to make sharper  
& brighter,

X #55 - ~~Tighten up & make equal.~~  
Hold for Smash Test.

#58 Tighten a little.

#60 Tighten -

#71 - Tighten up -

#72 - Let alone

#52 - Loud - stands out. Slight  
fringes.

#73 - Not as loud - little muffled  
but holds well. natural  
quality.

#67 - Louder - muffled - covered.

✓ #55 - Peak - back in horn but  
very natural quality.

#58 - Loud - covered somewhat  
but full & natural

#60 Loud - - horn tone - little  
sensative - full.

#71 - Covered & fringes, otherwise  
natural & full.

✓ #72 - Louder & cleaner but has  
slight fringes.

#70 - Does for further test.

#64 - Does for further test

#69 - Does for further test

#70 - Back in horn, covered,  
muffled.

✓ #64 - Good & loud. Holds well.  
Slight oo sounds.

✓ #69 - Quite more sensation than  
64 but big, full & natural

---

Took #50 to build over.  
Found first too sensitive & full.

① Tightened up.  
Became firmer & sharper &  
Red better & more natural.

② Put on new arm and  
sapphire. Good cut.  
Shows firmer & more  
natural. True & clear.

③ Tried #50 against #9  
with Mr. Botch on  
tube. #50 better - has not

the squeaks - is firmer & cleaner  
without any material  
sacrifice of quality.

10/28/15

Made up record #57-

Tested out record #57 against  
#9 & found it bigger & fuller &  
more sensitive on voice.

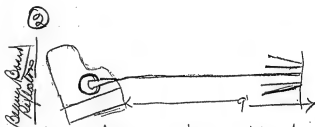
Piano Experiment with 2 #7  
horns & crab horn connected  
to recording machine by 12'  
pure gum rubber tubing, piano  
of fresh machine.

① #57 Record



Very loud & full. Bass shows  
up more than treble & overbalance





Still loud & full & big hits  
triple chords up to better  
balance.

- ③ Same as above but cut out  
crab how in middle of  
piece. Effect was to make  
lead very much thinner.
- ④ Same as above but harder  
heavier work. Should  
jump out on heavy bass  
chords
- ⑤ Same as above on  
"Spring Song". Still played  
jump cuts on A chords

⑥ Same as before but with cow hair reflectors behind piano in place of beaver board. Better - cuts out most of the jump-outs & blasts.

⑦ Test of tightening recorders. 1st as before. Field, loud, big. 2nd as tightened. Cleaner - not quite so full. Natural. Seems good.

⑧ Test with #9 recorder against #51. #51 shows bigger & fuller. #9 cleaner, clearer & sharper.

⑨ Test of 12' tube 9' piano against 6' tube piano 5' from recording machine. Louder, cleaner but harder - not so full & mellow as tone.

- (10) As before but with #7 horns  
raised higher to give crab horn  
more fullness.  
It made full & mellow & cleaned  
up the tendency to blast.
- (11) Same with crab horn raised  
piano to bring out fullness.  
Very full but blabby.

10/28/15-

Big, full head, somewhat  
penetrating but did not  
blast very big & full  
& natural which breaks.

10/28/15-

#51 - 1 minute record.

Brass 1/2" dia. Damed Top.  
knife edge pattern - 1/4" diam.

Diaphragm of Japanese  
paper - 2 thin coats of  
shellac. Cork core 1/16" x 1/32"  
shellacked to inside and  
cork of diaphragm given  
2 further coats of shellac.

Tapered aluminum arm.  
Regular 008 sapphire.

10/29/15

Met for Mpt of family  
in morning.

Nicholas sent over Mr. Trantwine  
new superman for instruction.  
Met also such things as thought  
of value with him.

Trantwine brings out value of:

- ① Rubber gaskets of B producers  
to have longer life and suggests  
sospotone liberally applied.
- ② That the diaphragms exposed  
to damp deteriorate.  
This may be cured by my  
scheme of coating with  
vaseline.
- ③ Need of loud Deamons-Rise  
for dancers and for motion  
picture houses & parapsychism  
would be good.

Quartette came in afternoon  
in good shape.

Made trials with recorders  
and decided #64 was good -  
compared favorably with #9.

Made experiment with reflectors  
close up against regular  
position. Record was louder &  
bigger but not so brilliant  
with close reflectors.

Pang Quartette in B 4 in  
place of B 4 as usual.  
Quartette pang well made  
master for mould.

Trials Quartette from Lucia. On  
third trial did very well.  
Will have to arrange distances  
better and get better balance  
and less interference. (Used  
Hayes and Dawson for extra  
voices.

With Quartette left after Mr.  
~~Strickland~~ left tried experiment  
of reflecting recording with each  
horn to piano against regular.

In this the record became bigger  
fuller and lost brilliancy as  
before.

Study of Cylinder Records #1550  
"Cady Jones" and 28215 "Elegie"  
phases:

To eye, apparently longer waves  
on soprano than on baritone  
piece. Under microscope the  
apparently long waves become  
surtones (from 6 to 12 to the  
pitch wave).

This Tenor record is "sharp"  
the Soprano record is "full".

It is apparent that the  
presence of the higher  
surtones produces sharpness  
in records and the predom-  
inance of the lower sur-  
-tones gives "fullness".

10/30/15.

Made up recorder #52 and  
tested out. First arm high  
too much surface. Put on  
lower arm. Still some  
surface. Quality good



- ① Arm rather high. Poor surface. Fuel, mealy.
- ② Arm lowered. Still some surface. Tone low, fuel rich.

10/30/15.

#52 - 4 min. recorder.

Brass Head, Knife Edge  
Pattern -  $1\frac{1}{4}$ " diameter.

Diaphragm of Japanese  
Paper, .001", 20 thin coats  
shellac.  
Cork Cone  $\frac{1}{32}$ " x  $1\frac{1}{16}$ " shellacked  
to outside and cone  
and diaphragm given  
4 coats shellac.

T section aluminum  
arm, regular 808" sapphire.

- ① Diminished surface somewhat but not enough. Back in horn
- ② Surface improved but tone still back in horn. Needle shows marks
- ③ Tone triple better but still back in horn

53 - Tighten up.

11/1/15.

Note up report.

Marked out recorder #52.

- ① Made lower arm & reset needle.
- ② Made new arm & reset needle.
- ③ Reset needle

Decided to make over.

Tests of Recorders back from Norway.

- #9 - Used as Standard.
- #66 - Sharper - Back in horn. Thinner. Weak. Hard.
- #53 - Full, big, natural.
- #62 - Quite weaker than 53. Natural tone. Not as big as #9.

#53 as before & Tightened.

#53 - Used as Standard.

#53 Tightened - Sharper on piano. Clearer, better definition, & held 20

better on voice.

11/2/5.

Made up record # 66 &  
tested out.

Surface bad. Quality good.  
Little sharper than #9 but  
firm & true & stands out.

Put on new arm, needle.

#9 Used as standard

#50 - Piano body - as much as as  
to West. Voice loud, big  
full. Too suggestive for  
voices at this distance.

#51 - Holds better than 50 - Piano  
full & natural. Voice full  
natural.

#64 - Not as loud. Holds better.  
Stands out nicely. Clean  
clear. Little sharper than  
any of above.

Mixed them back 2"

#9 - Used as Standard.

#51 - Louder than #9 - Halls were  
quite fuller. More sensitive  
than 9.

#### Experiment with & without Blinders.

#51 - without Blinders. Used as  
Standard. Little muffled

#51 - with Blinders - Voices better  
separated and diction better.  
Cleaner, less interference.

#### Experiments with 3, 1 and no blinders.

#51 - with 3 blinders -

Very full. Sounds little weak  
on voices. Pianos Good, muffled.

#51 - with 1 Blinder -

Pianos becomes thinner & sharper.  
Voices separate & become more  
distinct. Cleaner.

#51 - without Blinders -

Pianos sounds fuller again. Voices  
do not sound so separate but  
are trifle bigger & fuller than  
with 1 blinder, but not so much as 3

Piano Experiment =  
R50 - 2<sup>nd</sup> 7 horns - oval horn  
connected with 6' -  $\frac{9}{16}$ " rubber tubing  
1st low pipe  
Good full - natural but not  
enough ring

Experiment cutting out oval horn  
Difference with short horn not  
as marked.

Experiment oval horn and two  
#7 horns on piano, 12' rubber  
tube. Makes fuller - too  
full perhaps.

Experiment = Miss Bushbinder & Miss  
Ingmund playing same selection  
to determine difference of  
touch. Miss B - more brilliant  
and resonant.

Experiment Miss B & Dawson  
Singing 8 ft from 1 #7 horn.  
Sounds weak & far off. Balance  
fair. Both voices heard.

Misc/3 & Dawson - 6 ft away  
3-4 ft reflectors acting as funnel  
to horn. Gases become fuller &  
weaker. Pianos by & full.

Piano Experiment - 10 ft from  
machine P50 - 1/2 7 horn  
pointed at keyboard. Pianos  
sidewise to horn. Top open.  
& Beaver board screens behind.  
Very good and natural piano  
record. Try out further.

11/3/15

Made up recorder #66

#66 too much surface. Not  
as loud - further back in horn.  
definition better than #7. Note  
sharper.

#9 used as standard

Worked #66 over, flattening arm.  
Still too much surface.

Put  $\frac{5}{8} \times .003$  aluminum disc  
concentric, shellacking to diaphragm.  
Improves quality but still too  
much surface.

Changed to flexion arm.

Experiment Pianos 1st from  
machine.

① Cow hair screens behind  
pianos.

Clear, clear, good tone - only  
slightly plunky.

② Using heavier board / Reflection  
behind pianos.



Tone, bigger & fuller, than  
with ear <sup>to</sup> rain screens, but  
not as brilliant & <sup>trifle</sup> more  
brilliant.

- ③ Same as above except adding  
Orb. Horn on duplex connection  
to #7 Horn.

Not as good as before, seems  
to damp out.

Test of Cut out value on  
deduct.

- ① Regular Reading as standard.

- ② Use cut out value on  
baritone. Makes soprano  
much louder, bigger & fuller  
when value has baritone  
horn cut out.

Test of Records.

#9- Used as standard

#64- Not as loud. Quite back  
in horn. Sans triple tin.  
Very clear, & clean distinct

#66 (new) Not as loud as 9.  
Very clear & clear. Surface  
improved from former  
trial.

#4/15-

All day with Demonstrator

11/5/5

Experiment with cut off  
valves.

- ① With cut off valves in each  
of 4 way connector



On Riggett's Sawtelle, 1st  
opened valve on Tenor solo.

He was weak & back. Apparently  
not good.

- ② Made record regular way to  
compare. No better.

- ③ Made record -



Two way on machine. One  
arm having cut off valve  
to 3 way connector. Other arm  
to Tenor Horn.

This brings out the Tenor  
excellently but makes the other  
three thin and back in Horn.

- ① Muffled - shows muffled tone -
- ② Used as Standard. Better - clearer - clearer.

Made Records of Guitelle from  
Rusia, last one fair.

Experiment Cut off valves  
on duct:

- ① With cut off valves.
- ② Without cut off valves.

11/6/15

Nick Demonstrations.

11/8/15

With Demonstrators.

Examination in afternoon.

11/9/15

Grading Examination Papers.

Tests regards back from  
Alpen Studios -

#9 Used as Standard

#58 - Louder, fuller, more  
sensitive than #9. More  
muffled. Bands less natural.

#52 - Surface bad, sharper than 58  
Quality good but surface irregular.

#62 - Reg. full, triple muffled &  
sensitive. Will have tightening

#62 Tightened. Not as loud - sharper  
metallic. Also well. Even.

#62 loosened a little. Fuller than  
above. Compares well with  
#9 - is quieter - has less  
surface and is cleaner.  
Good Hold -

Test with Miss Buchlinder  
"Carry Me Back to Old Virginia"

#9 - Used as Standard.

#62. Quieter - Cleaner - not quite  
as loud - fuller more  
mealy.

Same singing "afterward"

#9 - Used as Standard

#62 - Not as loud. Sounds fine. Quieter  
Cleaner. Fuller, not as rich  
as #9.

#50 - Too big & full for voice. Fine  
on Piano. Irregular on  
voice.

#9 - Used as Standard

#64 - Cleaner - not quite as loud  
firmer & holds better. Less  
sensative. Diction Good.

#56 - Clean but harder & not so  
many overtones as 64. Colder.

But "When We Are Married"

#9 - As Standard.

#64 - Cleaner. Better Diction - not  
quite as loud.

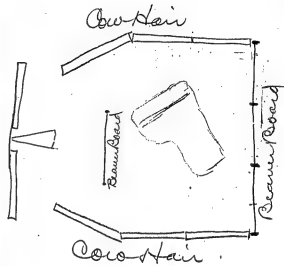


- #62 - Sheds out well. Clean.  
Brilliant.  
#66 - not as loud - further back  
but clean & rocks well.  
#58 - Louder than 66 - Clean - clear  
Shows piano fine. Harder  
& slower.

Mr. Borstrom came over to  
make violin record.

Test

- ① #9 Recorder as Standard.  
② #50 " much better on  
violin. Bigger, fuller,  
more natural.  
③ #50 with 1 reflecting screen  
close behind. Shows louder  
& bigger. Slight room tone.  
Plans not good.  
④ #50 - with 1 reflecting screen  
behind violin as per  
Sketch on next page.  
This arrangement made  
best record of the afternoon.



11/10/15.

Finished up Record #68  
\* tested.

#9 Used as standard.

#62 - Not quite as big and loud  
as #9. Harder Coler, not  
as natural & warm &  
mealy.

#68 - Little surface. Not as  
loud as #9 - but back in  
low - muffled - covered.

Revised to comparative  
Ovalon & Edison Records  
with Hayes.

Started Taylor on getting  
ready for show Friday  
afternoon for M. R. A.

#68 - Dome surface. Not as  
loud as #9 - Back in horn  
- muffled - covered.

Needs livening up.

② Makes it sharper, cleaner  
& stand out better.

11/10/15

#68 - 4 min. record.

Brass Lead-Knife Edge  
Pattern - 1 1/4" diameter.

Diaphragm of Japanese  
paper given 3 thin coats  
of shellac. Cork cone  
1 3/16 x 1/32" shellacked on top.  
Diaphragm and cone  
given 3 coats shellac.

② Tread shellacking center.  
in radial lines

Comparison #9 x #66 made  
over-  
#9 used as standard  
#66 - Fuller than #9. Needs well.  
Darker - more covered.

Made test of bases of Mr.  
Gregory x Mr. Gote.

Tested Transfer slide value on  
~~intermittent~~ solo work.  
Found that it brings out the  
solo parts very much and  
does not materially  
hurt the duet parts.

11/11/15-  
Teaching Demonstrators  
all day.

11/12/15.

Teaching, Demonstrations are  
morning.

Quartette in afternoon -

Tried records #9-62-68-64.

Of these #62 was best.

Then tried quartette, solo &  
sport using regular way &  
with transfer valves - due to  
tong to 3 way to others.

This made the tenor much  
louder on solo, but it was  
not good on the ensemble  
work sounds like - tenor  
and 3 others - tenor too much  
prominence & others muffled.  
D. tried 2 records of Dixie from  
Lucia on 6 way tubes. These  
showed up better than  
corresponding record on 4  
way tubes.

11/13/15.

Examining Demonstrators  
all day. May did not  
start until after 10 am. so  
did not finish until late.

Mr. Edison outlined testing  
work he wanted on  
horns.

Taylor owes to Spaulds to  
get film & record of  
Andrew Carnegie for  
~~Mr. P.~~

11/15/15.

Set up disc and recording machines for Mr. Edison's Horn experiment.

Made 29 records which Mr. E. listened to and graded the horns according to sensitiveness.

In this the long smooth brass horn (#2) came first followed by 10 fetal morning glory horns.

Horns of peculiar shapes and the usual recording horns were rated very much lower.



11/16/15.

Write up report.

Worked on rearing horns  
for Mr. Edison's experiment.

Found #48 - Music master best -  
#2 - Long Brass - second and  
#38 - Kinetophone - third.

Made these at 3-6-29. ft

The sensitiveness of horn  
seems to depend on the  
bell area of mouth and  
smoothness of inside. As  
proved by angle horn - crab  
horn etc, and by the fact  
that the angular Music Master  
horn stood first - the  
angle & trump make little or  
no difference.

With Miss Buchlinder's  
Dawson test. put Paragon  
horn against #7. Paragon

louder than #7 - as loud  
at 24" as #7 at 10". On solo  
not as good - tone ~~was~~  
clean & clear & musical.  
On Duet - tone much bigger -  
(not so thin) but harder to  
run together & not as musical  
soft & pleasant.

Tested with Mess. Beaklinder  
#38-48 x 2 horns against #7.  
These were louder, & to  
get almost same loudness

used #7-10"  
#2-24"  
#38-20"  
#48-20"

#7 was very full & not clear  
and clean.

#38 - triple better but not as  
clean as #7.

#48 - Best of lot but still perhaps  
not as clean & musical.

11/17/15.

Finished up horn records for Mr. E.

Wrote up suggestion about parabolic reflector for horn.

Got out other horns to test out.

Mr. E. outlined test of F and A horns against solid partition. Had Taylor prepare for this.

Discussed with Simpson, Smith, Kuhn & Cook methods of making up flares for #2 horn.

Miss Imgrund came in afternoon. Made pole and duct records comparing #A - 2 - 38 - 48 horns. A @ 9" - 2 @ 20" - 38 @ 18" - 48 @ 18".

#2 - 38 & 48 Horns are bigger & fuller than A on pole and bigger & fuller but much less clear and distinct on duct.

Made duct tests with  
slide valve - butterfly valve,  
transfer valve & plug Y.

But little difference noted.  
Apparently, the slide valve was  
the best of the valves as it  
showed best on the straight  
put part and as load and  
fuel as any on the solo.

11/18/15

With Demonstrators all  
day

11/9/15

With Demonstrators all  
morning.

Quartelle came in afternoon.  
Tried experiments recording  
with #7 horns and with  
#7, 38, 48 & 25 horns.

Mrs. Edison entered & listened  
to these tests and decided that  
#7 was best horn, and that  
the Quartelle in this was  
much better than with  
regular #7 horns.

Tried #9 against #6 & decided  
and decided that #9 was  
best.

Tried singers with Beaver Road  
reflectors at back & decided not  
as good as without.

Tried singers with saw Run  
reflectors at back & decided best of all.

11/20/15

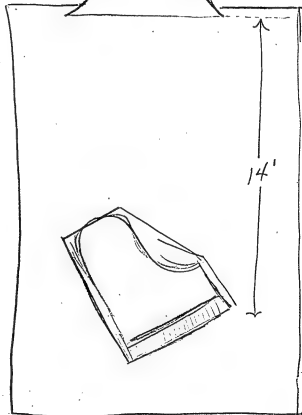
Examination of Demonstrators.

Mr. Edison outlined horn  
tests particularly with curved  
or bent horns.

Had Taylor make up new horn  
5" diam x 40" long as Matter  
mullen said his quartettes were  
worn with.

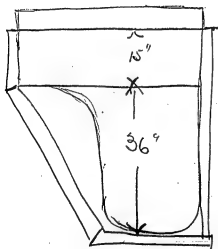
Tested this against # 7 (a) It  
is less sensitive and fuller.

5/5/16



(10)





5/16  
 Piano 14' from Stern  
 Recorder #132.  
 Test #1  
 Piano Closed

①

Test #2  
 Top open 6"

Test #3  
 Top open 12"

Test #4  
 Top open 18"

Test #5  
 Top open 24"

Test #6  
 Larger portion of top removed. 36"

Test #7  
 Both portions of top removed 57"

Test #8  
 Front part of top removed 15"

②

Piano 7' from Horn  
Rearden 13R

Piano Closed  
1

Open 6" 2

Open 12" 3

Open 18" 4

Open 24" 5

Open 30" 6

Open 36" 7

Open 42" 8

Front Open 15"

[ITEM(S) FOUND IN BOOK]

**November, 1915**  
**Edison Blue**  
**Amberol Records**

**CONCERT LIST**

75 cents each

**O Dry Those Tears, Foras Del Rio**  
**Helen Stanley No. 28218**

*Supra, melodic accompaniment*

This old-time favorite needs no introduction to any one who is at all familiar with drawing-room songs. Some have called this the most appealing melody ever written. Certainly it does cry you in a way that few other songs of its kind ever could. Helen Stanley was a member of the Century Opera Company in 1914.

**Una furtiva lagrima—Eloge d'Amore, Gedeone**  
**Donizetti Karl Jörn No. 28217**

*Tenor, orchestra accompaniment*

Jörn's wonderful rendition of this rich, lyric melody must be considered in every way a masterpiece. His voice records perfectly, and the record he has made is worthy of a very frequently repeated hearing.

**REGULAR LIST**

50 cents each

**Absent, John W. McNeill**  
**Hardy Williamson No. 2728**

*Tenor, orchestra accompaniment*

This is one of those few drawing-room songs that are still favorites after a long popularity. It is known and loved in thousands of homes throughout the English-speaking world, for few songs of its kind have ever made such an appeal as this one. Its keynote is simplicity of melody, and tenderness of sentiment.

[ITEM(S) FOUND IN BOOK]

Ah! Could I But Once More So Love, Dear,  
W. Adler  
Ten, soloists accompanied

This German song is popular both abroad and in this country. It is particularly a very fine melody, and gives Emory B. Randolph full scope for the display of his technical and artistic ability.

The Call of the Motherland, Edward W. Miller  
Frederick Wheeler and Male Chorus No. 2747  
Soloists, soloists accompanied

The great European war has inspired all Canada with a deeper love for the Mother Country, and the present selection voices the leading sentiment of Canada today. The melody of the song has a sturdy, swinging rhythm. Frederick Wheeler is lucky to find advantage.

Chasse aux Papillons—Serenade, L. Fontaine  
Wayart A. Moor No. 2725  
Soloists, soloists accompanied

A brilliant "Butterfly Chase," or so the name indicates. Several dainty tunes are heard, all graceful, light, and airy as the fluttering butterflies they represent. Wayart A. Moor is recognized one of the best flute players in the country. He throws the music of these swift passages in a way that bewitches him a true artist's possession in a way that bewitches him a true artist's possession.

Da's What I Calls Music  
Edna Bailey No. 2743  
Soloists

As Edna Bailey herself states, this rendition gives an old recorder hint of what she considers good music. It is not an over thing to impersonate a character of this kind by the author. Yet we get a perfect representation of the old manner happily recalling the times she loved the pathos, and then the joy and enthusiasm of a simple old negro.

Firefly (My Pretty Firefly), Glenn and Pinedale  
Irving Kaufman and Chorus No. 2774  
Ten, soloists accompanied

This song has, in the presence of Broadway vaudeville, "gum legs." It is recorded here in a most interesting and elaborate way. Shorter and the beating of tom-toms and rattles to the verse, and the catchy melody of the refrain is partly carried by bells in a way that is exceptionally lively and charming.

A Flower of Italy, D'Agostino  
Isidore Meskowitz No. 2723  
Soloists, soloists accompanied

Isidore Meskowitz has never made a finer record than this one—giving a brilliant, artistic interpretation of D'Agostino's violin composition, "A Flower of Italy."

Garden of Roses Waltz, Elsie Brooks  
New York Military Band No. 2730

In contrast to the many modern dance pieces that we hear everywhere these days, is this charming little waltz by Elsie Brooks. It is well named "Garden of Roses." First comes a short introduction, and then a waltz theme that is so simple and so very full harmonies, suggesting the name the waltz has given the piece. This is a very pretty melody, and is followed by a second theme, quite short and brisk and vivacious. Then comes a legato waltz, really the prettiest of all.

If You Can't Sing the Words, You Must  
Whistle the Tune, Herman Burrows  
Billy Murray No. 2732

Ten, soloists accompanied

You can gather some faint idea of this song from its title, but you'll never believe how amusing it is until you hear the record. The tune you are enjoined to whistle is extremely catchy—a typical ditty. The music interest of the selection lies in its clever words.

Mother Macree, Oloof and Bill  
Walter Van Brunt No. 2738  
Ten, soloists accompanied

One of the best of all the Chaucery Oloof ballads. It was sung with great success by Oloof in the days. "The Ballad of Macree" and "The Ballad of Macree."

My Big Little Soldier Boy, Mabelle Carolea Chorus  
Glen Ellison and Chorus No. 2727

Since the outbreak of the European war, "soldier" songs of every kind have been most popular. The present selection, however, is far and away above most of the kind in merit.

My Hula Maid—The Passing Show of 1915,  
Leo Edwards  
Gladys Rice and Irving Kaufman No. 2736  
Soloists and choir, soloists accompanied

The New York Winter Garden has gradually become "the place of the night of the night." It is a place that every stranger of the city feels he must visit. "The Passing Show of 1915" proved one of the most popular of all the annual "reviews" that are the feature of the city's night life. "My Hula Maid" was one of the big hits of the 1915 "Passing Show."

Paula Waltz, Ardis Guido Glindini No. 2742  
Soloists

In its original vocal form this brilliant waltz-song has been a favorite for many years. As while by Guido Glindini it makes a novel and enjoyable record. Glindini is one of the cleverest while there before the public, and this selection gives him ample opportunity to display his remarkable talent.

Porcupine Rag, Chas. J. Jackson  
New York Military Band No. 2739

As an outburst just it when bearing this record for the first time? "This is the real stuff—not an imitation. And so it is—regular old-fashioned ragtime of the ragtime variety. The selection is played in a dancing style that carries you along with it."

Ragging the Seals—Fox Trot, Edward B.  
Clayton Jaund's Society Orchestra No. 2734  
Soloists

This extraordinary piece is well named "Ragging the Seals." In very truth it rags it, shreds it, and tears it into little bits. As you might surmise, the melody is curious, to say the least. The selection is recorded in strict dancing tempo, and is sung of "Fox Trot." For dancing you will find the record ideal.

The Roly Monsters  
Billy Golden and James Marlowe No. 2723

Now Franklin D. Roosevelt has been elected. Billy Golden and James Marlowe are old-timers at black-face comedy. On this record they each describe the numerous roles they have played. And in their own words, it is "some collection."

[ITEM(S) FOUND IN BOOK]

**Spring Flowers, B. Matiffant**  
**Mary Carson No. 2733**

*Soprano, soloists accompanied*

A brilliant coloratura soprano, light, dainty, and wholly absorbing, Mary Carson's florid voice is heard to fine advantage, and she sings the many difficult cadences and trills that embellish this song in a way that shows her a true artist, and compels your admiration.

**They All Did the Goose-Step Home, M. H. Scott and Goffrey**  
**Irving Kaufman and Male Chorus No. 2741**

*Tenor, soloists accompanied*

It is surprising how many clever popular songs originate in England—surprising to us in America who think we are the only ones capable of writing such hits. This one was first published in London, and became a great favorite in English Music Halls. The words are amusing, and Irving Kaufman makes the most of them.

**Treasure Waltz—Cyppe Baron, Strauss**  
**Hungarian Orchestra No. 2744**

One of the best waltzes ever written by the greatest waltz writer of them all—Johann Strauss. It was originally brought out in the operetta, "Cyppe Baron," half a century ago and ever since has been popular.

**Twinkle Waltz, Vandenberg and Behner**  
**Charles Daab No. 2731**

*Exoticist, soloists accompanied*

Charles Daab has been a favorite with Edison owners for many years. The selection he plays here is a brilliant, breezy number, whose light, graceful waltz melody are well described by the name "Twinkle Waltz."

**Waipale Medley**  
**William Smith and Walter K. Kolomoos**  
**No. 2726**

*Harmonica duet*

The Hawaiian guitar is made of koa, a wood that grows on the islands and is considered sacred. The guitar is played, not by pressing down the strings, but by sliding a steel crosspiece along them. This produces the curious tone quality that makes the crying, pleading music of this instrument unlike anything else on earth.

**We'll Never Let the Old Flag Fall, M. F. Kelly**  
**Frederick Wheeler and Male Chorus No. 2746**

*Baritone, soloists accompanied*

This is a modern British patriotic song—Canadian product. Strains of "God Save the King" are cleverly woven into the music of both introduction and refrain.

**Where the Water Lilies Grow, Harry Green**  
**Royal Fish and Chorus No. 2735**

*Tenor, soloists accompanied*

First popular in England, this song was introduced in America by a well-known prima donna in vaudeville, and published here in 1876, becoming a great favorite. In the instrumental introduction, between verses, and also at the end of the selection, a xylophone and violoncello are heard, each playing a different melody.

**Woodland Songsters—Waltz, C. M. Zieher**  
**American Symphony Orchestra No. 2737**

This record transports us into the heart of the wood—the woods is singing, with the birds singing in the trees, a bubbling brook beneath, the sun shining through the leaves and all nature in her happiest mood.

**You're My Girl, Mohr and Silbermann**  
**Walter Van Brunt (introducing Helen Clark)**  
**No. 2745**

*Tenor, soloists accompanied*

The verse is a fine, slow waltz; then the refrain has a sort of "lullaby" rhythm, and is one of the catchiest tunes heard this season. The second refrain introduces Helen Clark, and gives a novel effect to the rendition.

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**END**

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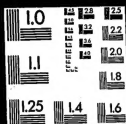


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